

NEW DIRECTIONS IN BUILDING AUTOMATION

Within the past five years Honeywell's advances in centralization and automation have revolutionized the control of operational systems in buildings. The literature in this jacket covers the many aspects of this subject.

The buildings of today which will still be modern tomorrow bring all of the following operational functions under centralized supervision and control:

UTILITY CONTROL

Lighting Systems	{	Interior
		Exterior
		Emergency

Water and Steam Systems	{	Tank levels
		Pumps
		Pressures
		Fire sprinklers
		Lawn sprinklers
		Snow melters
		Boilers

Gas supplies
Refrigeration systems

COMMUNICATION

Voice Communication	{	Telephones
		Intercoms
		Paging and public addresses

Signal lights

Alarms	{	Fire
		Smoke or gasses
		Sprinkler system operation
		Disturbance
		Civil Defense
		Burglary or trespass
		Excessive or freezing temperatures
		Radiation danger

Closed-circuit television

RECORD KEEPING

Watchmen's inspection
Arrivals and departures
Air-conditioning logs

MECHANICAL EQUIPMENT

Locks	Access doors
Door openers and closers	Fire doors
	Gates
Dampers	
Fans	
Elevators and escalators	

1 Receiving data-signals

2 Assimilating them

3 Transmitting action-signals

In air conditioning, for example:

1 INCOMING DATA SIGNALS

from

Sensors

Resistance bulbs
Thermocouples
Pneumatic bellows
Bimetals
Humidity elements
Pressure and flow elements
Off/On switches
Off-limits end switches

can be transmitted
to a central panel
by

Carriers

Individual wires
Multiplexed circuits
Individual pneumatic tubes
Multiplexed pneumatic tubes

2 ASSIMILATION

Signals received by

Receivers

Lighted pushbuttons
Precision indicators for selective indication
Precision instruments for constant indication
Analog strip-chart recorders
ScanAlarm* annunciators for
off-limits conditions
Automatic-typewriter digital loggers
Audible alarms
Digital alarm printer

are visually
displayed
by

Displays

Permanently mounted
panel- diagrams
Selectively projected
diagrams
Strip-chart records
Typed logs
Printed records

for purposes
of

Routine Operation
Operator Training
Systems Analysis
Flexible Maintenance
Scheduling

3 ACTION

Centralized manual start/stop switching
Timed automatic start/stop switching
Centralized control-point adjustment
Log-analysis and filing

is carried
out
to

Reduce operating costs
Reduce manpower costs
Reduce maintenance costs
Extend equipment life

The buildings of today which will still be modern tomorrow bring all of the following operational functions under centralized supervision and control:

UTILITY CONTROL

- | | | |
|-------------------------|---|-----------------|
| Lighting Systems | { | Interior |
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| Water and Steam Systems | { | Tank levels |
| | | Pumps |
| | | Pressures |
| | | Fire sprinklers |
| | | Lawn sprinklers |
| | | Snow melters |
| Gas supplies | { | Boilers |
| | | |
| Refrigeration systems | | |

COMMUNICATION

- | | | |
|---------------------|---|------------------------------------|
| Voice Communication | { | Telephones |
| | | Intercoms |
| Signal lights | { | Paging and public addresses |
| | | |
| Alarms | { | Fire |
| | | Smoke or gasses |
| | | Sprinkler system operation |
| | | Disturbance |
| | | Civil Defense |
| | | Burglary or trespass |
| | | Excessive or freezing temperatures |
| | | Radiation danger |
| | | |
| | | |

RECORD KEEPING

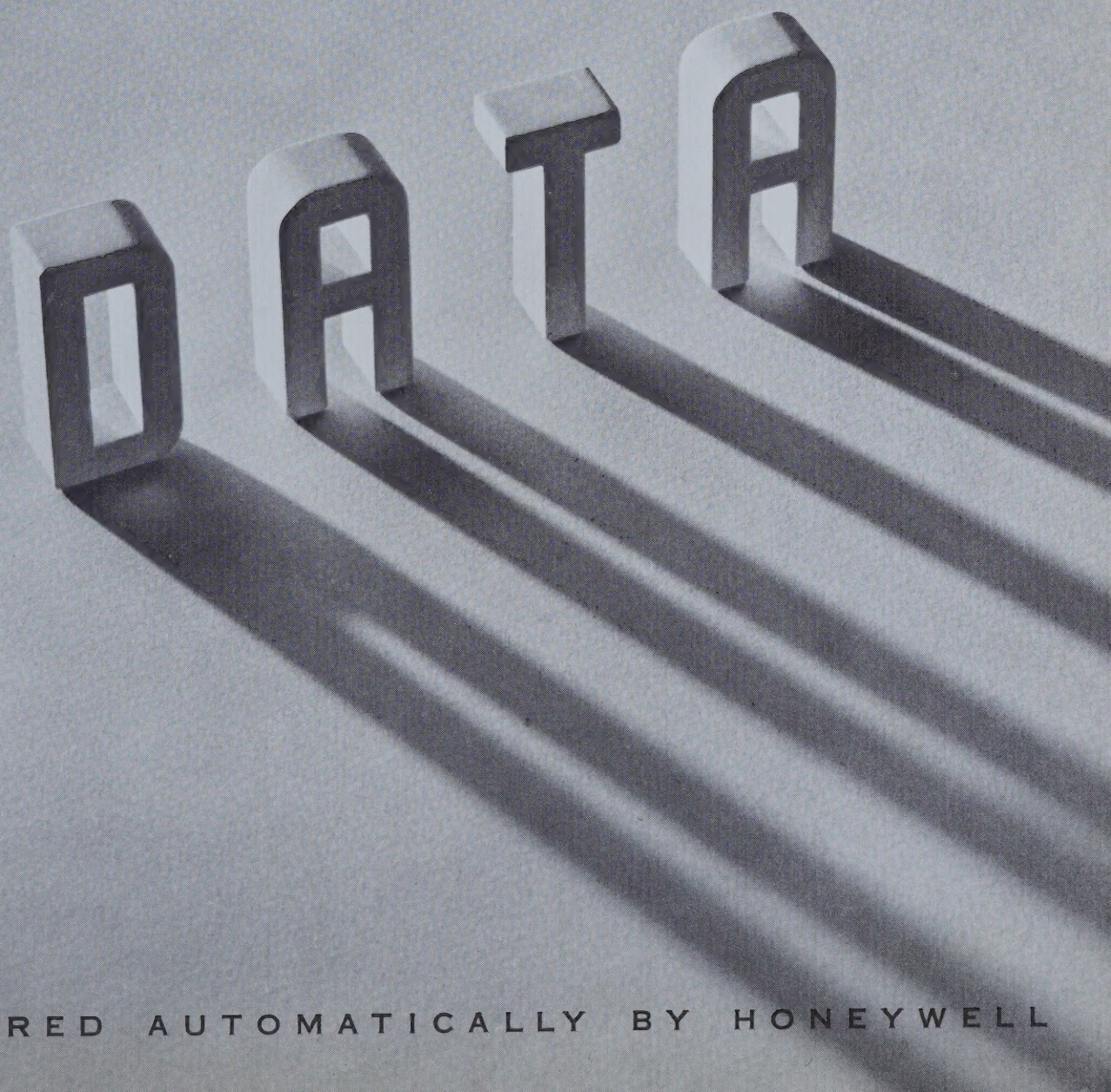
- Watchmen's inspection
- Arrivals and departures
- Air-conditioning logs

MECHANICAL EQUIPMENT

- | | |
|--------------------------|--------------|
| Locks | Access doors |
| Door openers and closers | Fire doors |
| | Gates |
| Dampers | |
| Fans | |
| Elevators and escalators | |

Closed-circuit television

YOUR BEST-YET ANSWER TO EFFICIENCY
IN LARGE AIR-CONDITIONING SYSTEMS



ACQUIRED AUTOMATICALLY BY HONEYWELL

To log or not to log ...not really a question

Until 1955, when Honeywell first introduced centralized control, logging the temperatures and other variables of any sizeable air-conditioning system was standard operating procedure. In best-run systems today, it still is.

Regular and accurate logging tells a lot. There's more to running a building than meets the eye—more to knowing what and how your air conditioning is doing than just reading an air gage or precision indicator and learning where a temperature stands right now. What was it an hour ago? Two hours? Or four? Is it staying where it should be? Or, if you've recently made adjustments based on outdoor or indoor changes, is it going up or down—the way you want it or the way you don't?

Actually, many operators—including some of the best—today don't know. Now with a central panel, they don't have to ride up several floors or walk a block or so to find out what's what. So they no longer check conditions routinely and write them down.

Logging took time

There's plenty else to do in keeping any system running right, and, even at a central panel, checking and logging takes time. Besides, with centralized operation, performance has been tremendously improved over the days when logging was a must. So these operators skip logging in favor of other work. If things seem to be running smoothly, they wait until a complaint comes along. Then they push a check-button, make an adjustment, and check again later or, at most, plug in their recorder on the trouble-spot. Centralization has helped so much that

they get along impressively well on occasional pokes and a prayer.

"Still, we'd log if we could"

This way of operating is great compared to yesterday's methods of walk and wait. But even these operators themselves agree it's not the greatest. It's a matter of manpower and using it the best way possible. "We logged at first and still would if we had time", is a common remark. "It'd improve things a lot to have some record of what we're doing."

And those with the staff to do it are just as enthusiastic about logging as ever. "We've kept these logs for the two years now since we opened and they really pay off. They're useful every day and over the long run, too. We operate more efficiently by studying past performance. And we keep our equipment in better shape. We overhaul it when it needs it, not just when some hard and fast schedule says so or—worse yet—after we run into trouble and get a serious breakdown. We save power and fuel and we've got everyone thinking we're great. It's our panel plus our log that deserves the thanks."

Biggest buildings need logging most

Ironically, it's the biggest systems, with the biggest investment in equipment and occupant satisfaction, that often give up logging. That's because they also have the biggest logging-job to do, the most time-consuming number of points to check, and the most maintenance work, too. Until now, only fairly rare and outstandingly well-equipped or well-run systems have enjoyed the efficiency that regular, accurate logs can give.

Now Honeywell has the answer

Honeywell Datalog typewriter in foreground automatically logs air-conditioning variables at this Supervisory DataCenter. Shift-engineer is checking an alarm-response on his Honeywell security system unit. Above his head and ranging to the right are units for fire-alarm, equipment-surveillance and master-clock and signal-programming systems. Intercom unit behind Datalog typer communicates with fan rooms and other operational locations.



The *automatic* answer is Honeywell's

AUTOLOG

Data-Acquisition System

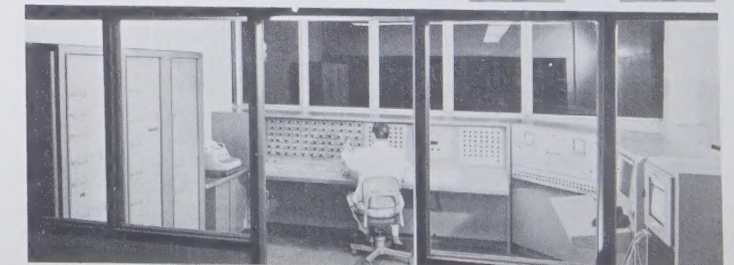
Datalog typewriter for routine logging:

- * Logs temperatures, pressures, humidities and flows—any number of them—automatically.
- * Records power-consumption, fuel-consumption and BTU-output in full-system or sub-system totals—automatically.
- * Eliminates—automatically—all human errors in reading variables and in recording them.
- * Saves manhours formerly needed for recording hundreds of variables.
- * Automatically eliminates data-distortion caused by time-lapses between manually logging one part of a big system and other parts. Requires less than three minutes to record 200 variables instead of half an hour.
- * Permits watching trends—correcting drifts before they lead to complaints.
- * Permits flexible, planned maintenance, using maintenance personnel when they're available and where they're truly needed. No arbitrary scheduling—no serious breakdowns—no unnecessary wear and tear on equipment, or manpower, or building occupants!
- * Permits year-by-year improvement in operating performance, reduction in fuel and power costs.
- * Records off-limits conditions in red, automatically, for subsequent analysis.

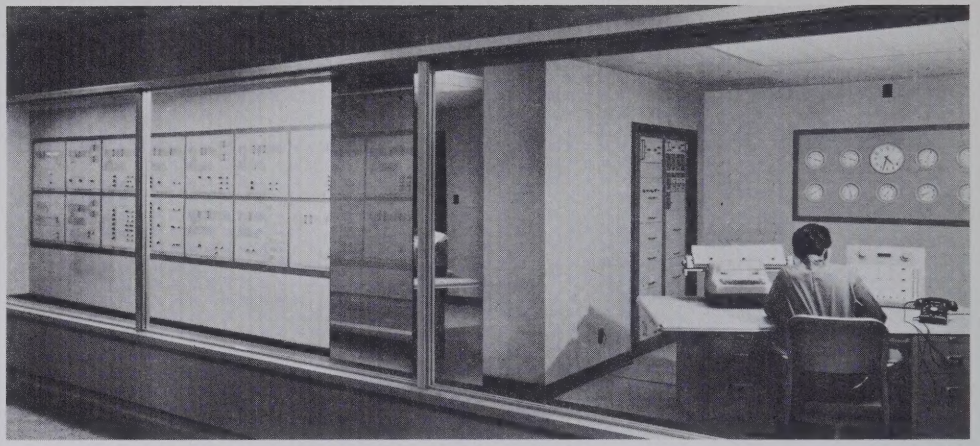
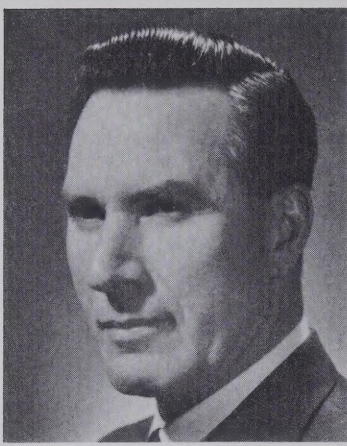
Datalarm printer for calling immediate attention to off-normal conditions:

- * Scans temperatures, pressures, humidities and flows for off-normal conditions.
- * Scans at any desired regular intervals, or on any desired flexible schedule.
- * Uses industrial-grade stepping switches—millions of scan-contacts without a breakdown.
- * Sounds immediate audible alarm when any scanned variable goes outside normal limits.
- * Automatically prints separate alarm-log, showing time, location number of off-limits variable and present reading of the off-limits variable.
- * Can be silenced while off-limits variables are being corrected or are routinely settling out.
- * Sounds automatic notice when conditions return to normal, warning operator to switch the audible signal on again.

Supervisory DataCenter, Autolog, Datalog and Datalarm are all Honeywell trademarks.



Supervisory DataCenter at Trans-Canada Airlines' overhaul base. Electronic components of Honeywell data-acquisition system visible at left are housed in cubicles like those ranged across the top.



"Everyone's a long way ahead."

Verbatim quotations from a conversation with Mr. Bruce Goldie, Chief Air-Conditioning Engineer, Queen Elizabeth Hotel, Montreal.

"Can you imagine the number of men I'd need to run this system without our central station? Forty-odd separate fan-systems, and we operate all of them with one man on shift and one assistant for legwork and to attend to other duties. Why, it would cost us at least \$15,000 more a year—and that's conservative.

"As for our logging system, I can scarcely visualize how we'd operate without it. You can't run a large engineering system efficiently without records, any more than you could run a business. In my opinion, this is the best method I've seen yet for logging air-conditioning data for future reference which, incidentally, is quite frequent with a new system during the first year of operation.

"For example, when we had trouble with some reheat settings and called in the air-conditioning manufacturer's expert for readjustment of controls, we were able to furnish him with a usable set of records for that segment of our system. With these log sheets you can whip back through several months, pick out whatever points you need and draw a graph if you wish. With our log, the air-conditioning engineer was able to determine immediately what should be done. He drew graphs, studied them, changed the slope of one reheat curve as out-

side temperature dropped, and all he needed was one try to clear up the whole problem.

"Aside from trouble-shooting, those graphs are important protection for an hotel, hospital, or any other building dealing with the public—or in any situation where room-temperature really matters. The scanning system means that we can spot any load-shift before a headwaiter screams and compensate for it before we have anyone mad at us. Why, without the records, the operating engineer is caught right in the middle.

"Cranks write in—they were 'freezing' during their stay here. Well, we have the facts right here, and we can show the management and the guest or anyone else exactly what the temperature was in our public areas during their entire stay. As for the individual guest rooms, their primary-air discharge-temperatures and the temperatures of the chilled or hot water for their under-the-window air-conditioning units are also logged. So we know what temperatures we're offering, even though the final selection is left to the guest and his individual thermostat.

"I could go on indefinitely—but you see my point. With centralization to save steps, and with data as a guide in planning our maintenance, we provide more satisfying air-conditioning to the public and we keep our equipment in better shape within a reasonable payroll. Automatic logging has put everyone a long way ahead."

Honeywell

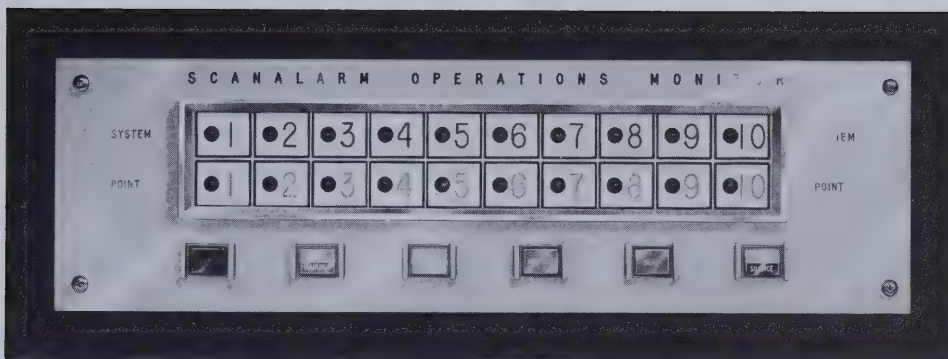


First in Control

HONEYWELL • MINNEAPOLIS 8, MINNESOTA • TORONTO 17, ONTARIO

Post an automatic guard
over every keypoint
in your air conditioning with
**HONEYWELL'S
SCANALARM**
Systems Operations Monitor

Now, one small indicator can do 100 important jobs!



As any building-operator knows, air conditioning needs watching. The closer the attention, the better the results.

Honeywell's centralization of control has made this attention economical, by eliminating all the travel formerly needed for on-the-spot temperature readings. But with a building of any size, even centralized temperature-checking is time-consuming. That's where ScanAlarm comes in.

Alarm Readiness Without Motion, Wear or Power

Each ScanAlarm monitors as many as 10 variables in each of 10 different zones. Open-contact switches do the job—no power, no wear, no moving parts during normal conditions. But when any variable goes off-limits, a contact is closed and ScanAlarm goes into action.

An audible alarm is sounded—at the panel or anywhere desired. There a stepping switch scans all 100 variables in one-fifth of a second. As it finds an off-limits condition, it locates it on the annunciator—one light for the zone, another for the alarm-point. Subsequently, it will recycle at specified intervals and will extinguish the annunciator lights when the alarm-condition has been eliminated.

The audible alarm can be silenced while corrective action is being taken. Then when all conditions are normal again, the alarm will sound once more to indicate an "all clear", reminding the operator to switch back to the normal alarm setting.

ScanAlarm adds automation to your centralization. It's your ideal economical approach to keeping an automatic eye on crucial system variables without cluttering up your central panel with a confusing maze of gauges.

- * Each unit scans up to 100 variables within 1/5 of a second.
- * Sounds immediate alarm when any condition goes off-limits.
- * Offers visual readout of code number for any off-normal condition.
- * Uses minimum wiring—only 21 wires for 100 variables.
- * Occupies minimum panel-space.
- * Uses no moving parts during normal conditions.
- * Guards duct, space and water temperatures. Air flow. Operating conditions of mechanical and electrical equipment.

"ScanAlarm" is a trademark of Minneapolis-Honeywell Regulator Company

Startup and Switchover Watchdog

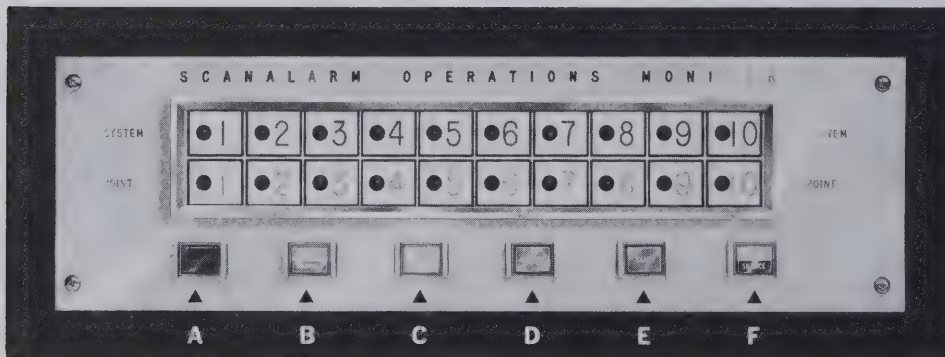
Besides standing guard around the clock, Honeywell's ScanAlarm gives extra assurance when a system is first started up or when it is switched over from night-time to daytime operation or vice versa.

At these times, operator switches off his audible alarm. Variables set off-limits by the changeover all appear on the annunciator together. As they settle out one after another, their annunciator lights go out. Operator can watch his system settling out or can attend to other duties. When settling-out is complete, alarm will sound and can be switched back to ready position. If any condition fails to reach normal limits, a glance at the annunciator locates it.

Decentralized Centralization

With Honeywell ScanAlarm, an operator can keep his entire system under surveillance from any part of his building. Listening through his intercom at any time can tell him "All's well" or can recall him, with the audible alarm, to his central panel for checking and correcting any off-normal situation.

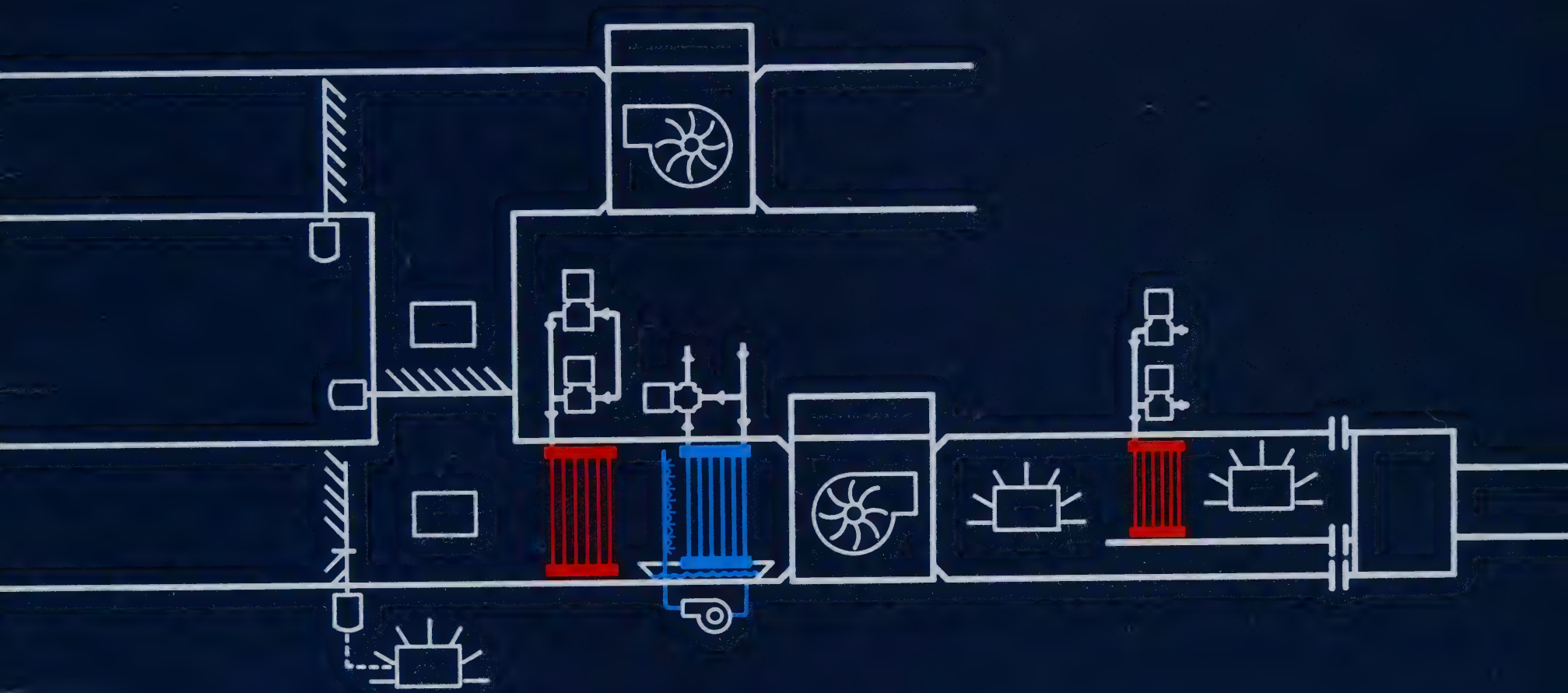
Put ScanAlarm to work for you in your next building. You'll find it the biggest improvement in the smallest space you've ever used yet.



- A► POWER OFF/ON SWITCH:** Puts power on lines connected to as many as 100 open switches at temperature, pressure and other checkpoints.
- B► AUTO/MANUAL SWITCH:** When more than one system has one or more off-limits conditions, this button switches from automatic scanning of all systems to a manual-checking condition in which the systems may be checked one at a time.
- C► RESET SWITCH:** When an off-limits condition has been corrected, permits immediate extinguishing of the condition's indicator light without waiting for automatic recycling.
- D► ADVANCE SWITCH:** For manually checking systems one at a time, this switch advances the annunciator from one system to the next.
- E► READ SWITCH:** Used for lighting off-limits. Point lights when manually checking systems one at a time.
- F► BUZZER/SILENCE SWITCH:** Permits silencing of audible alarm during correction of off-limits condition or during settling-out period following start-up or changeover. If buzzer has been manually silenced, it will sound again automatically when conditions return to normal, reminding operator to return audible alarm to normal alert-condition.



HONEYWELL • MINNEAPOLIS 8, MINNESOTA • TORONTO 17, ONTARIO



because your building deserves the best...



ACKNOWLEDGEMENTS

Progress is not manifested simply in theory or in the abstract. Progress in the economy and efficiency of centralized air-conditioning control has been made in specific air-conditioning systems in actual buildings throughout the country.

Honeywell has supplied the tools. It was Honeywell's electronic-pneumatic transducer that opened the way to centralizing pneumatic systems as first exemplified in Chicago's Prudential Building in 1955. The same year, a centrally operated all-electronic Honeywell system went into Houston's Bank of the Southwest.

It was the engineering consultants designing systems for these and for subsequent progress-making buildings, however, who used these devices in original, constructive ways to save building owners thousands of dollars in the operating costs of their structures. It was these engineers and the architects in whose buildings the new ideas were incorporated who have brought air-conditioning control forward to its present state of centralized operation. It is to them and to the contractors who have realized their plans in actual equipment that credit is due and this book is dedicated.

Following are the buildings illustrated in this book and the architects and engineers and contractors who designed and built them:

Front Cover—Title and Honeywell colophon supplant the identifying information for a system diagram on the Selectographic Console of St. Paul Fire and Marine Insurance Company's offices where several buildings and additions are being united under central operation.

Architect and Engineers: Childs and Smith, Chicago. Mechanical Contractor: R. L. Anderson-Cherne, Inc., Minneapolis. Electrical Contractor: Commonwealth Electric Co., St. Paul.

Page 4—Main entrance lobby, General Mills Building, Minneapolis. Architect and Engineers: Skidmore, Owings and Merrill. Mechanical Contractors: R. L. Anderson-Cherne, Inc. Electrical Contractor: Langford Electric Corp.

Page 6—St. Mary's Hospital, Minneapolis. Architect: Hills, Gilbertson and Fisher. Engineers: Bruch and Morrow Inc. Mechanical Contractor: M. J. McGough Co. Electrical Contractor: Batzli Electric Co.

Page 7—Santa Clara County office building. Associated Architects of Santa Clara County. Mechanical Engineers: Francis E. Adams and M. J. March. Electrical Engineer: George E. Ninnis. Mechanical Contractors: Gilmore Air Conditioning Service and Kleinen Co., Inc. Electrical Contractor for Temperature Control: Durbin Electric.

Page 8—Supervisory DataCenter, General Mills Building, Minneapolis. Architect and Engineers: Skidmore, Owings and Merrill. Mechanical Contractor: R. L. Anderson-Cherne, Inc. Electrical Contractor: Langford Electric.

Page 9—Supervisory DataCenter, Shreveport Club. Architect: Neild, Somdal and Associates (now Neild, Somdal and Smitherman). Engineers: Carl M. Hadra Associates. Mechanical Contractor: Mechanical Contractors Inc. Electrical Contractor: Cahn Electric Co.

Page 11—Selectographic Console, Government Employees Insurance Company office building, Washington, D. C. Architect: Vincent G. Kling. Engineers: A. Ernest d'Ambly. Mechanical Contractor: W. G. Cornell Co. Electrical Contractor for Temperature Control: Howard P. Foley Co.

Pages 14-15—Central control room, Bank of the Southwest, Houston. Architect: Kenneth Franzheim. Engineers: H. E. Bovay and Reg F. Taylor. Mechanical Contractor: Straus-Frank Co. Electrical Contractor: Fisk Electric Co.

LoggerScanner desk, Queen Elizabeth Hotel, Montreal. Architect: G. F. Drummond and H. C. Greensides, Chief Architects Canadian National Railways. Engineers: N. S. B. Watson, C. N. R. Mechanical Contractors: John Colford Contracting Co., Ltd. and Canadian Comstock Co., Ltd. Electrical Contractor: Mofax Electric, Ltd.

Prudential Building, Chicago. Architects and Engineers: Naess and Murphy. Air Conditioning and Refrigeration Contractor: William A. Pope Co. Heating Contractor: H. P. Reger and Co. Ventilating Contractors: R. B. Hayward Co. and Jamar-Olmen Co. Electrical Contractors: Fischbach, Moore and Morrissey, Inc., Emerson-Comstock Co., Inc., J. Livingston and Co.

Pages 20-21—Job-site scenes at Santa Clara County office building. Architect: Associated Architects of Santa Clara County. Mechanical Engineers: Francis E. Adams and M. J. March. Electrical Engineer: George E. Ninnis. Mechanical Contractors: Gilmore Air Conditioning Service and Kleinen Co., Inc. Electrical Contractor for Temperature Control: Durbin Electric.

Pages 22-23—Classroom and Supervisory DataCenter/Light Saver panel, Sequoia School, Manteca, Calif. Architect: Mayo, Johnson and deWolf, Stockton. Mechanical Engineer: Keller and Gannon, San Francisco. Electrical Engineer: Williamson and Vollmer Engineering Inc., Oakland. Mechanical Contractor: Hansen's Inc., Modesto. Electrical Contractor: Collins Electrical Co., Stockton. District Superintendent of Schools: Neil A. Hafley. Classroom photograph courtesy Western Asbestos Co.

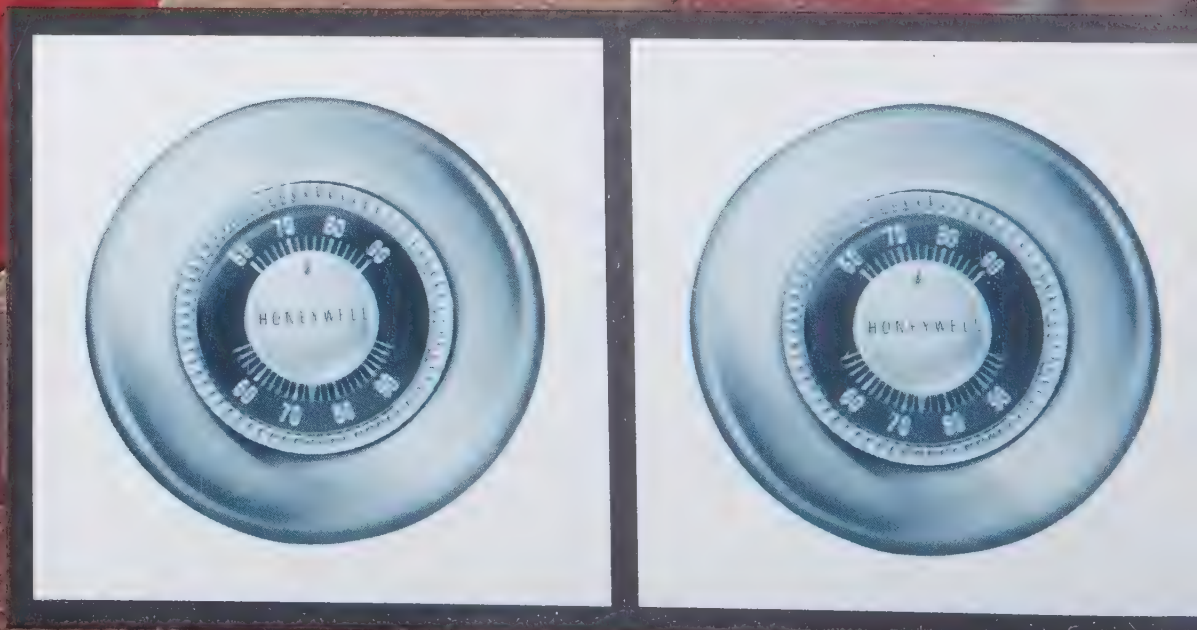
Selectographic Console with DataHandling and LoggerScanner equipment at Trans Canada Air Lines engineering and maintenance base, Montreal. Architect and Engineers: Ross, Patterson, Townsend & Fish. Mechanical Contractors: Canadian Comstock Co., Ltd., and Samuel Crump, Ltd. Electrical Contractor: Fischbach and Moore of Quebec, Ltd.

Building model and central control room (air conditioning, security, fire alarm, master time and programming), Pure Oil office building, Palatine, Ill. Architect and Engineers: Perkins and Will, Chicago. Associate Engineers: E.R. Gritschke and Associates, Chicago. Mechanical Contractor: Economy Plumbing and Heating Co. Electrical Contractor: Kelso Burnett, Chicago.

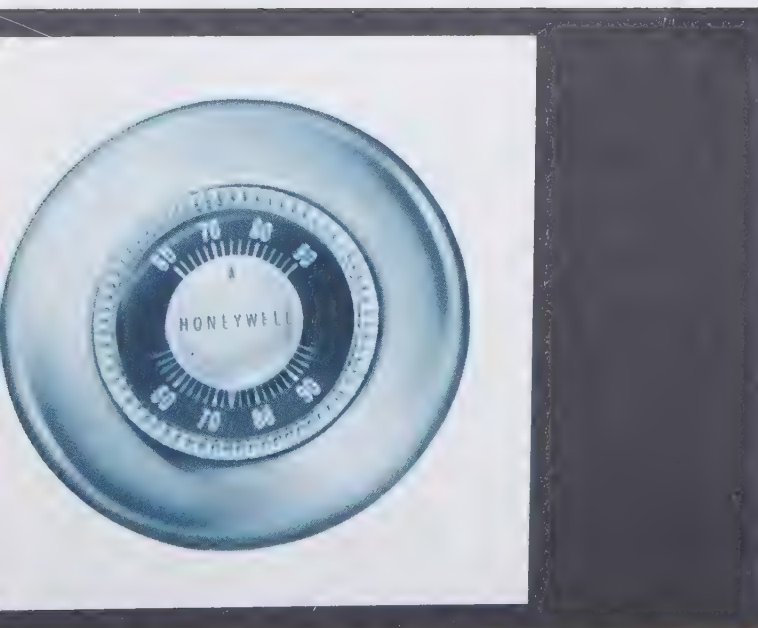
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**Trademark*



THE MARK OF DISTINCTION THAT IS MORE THAN MERE MARK



Visible on the walls at many of the world's most distinguished buildings is a hallmark of quality design and construction. It's so widely known for quality itself that it adds a note, as surely as the maker's crest on a splendid automobile, to other details which speak for the fine character of a building.

This distinctive detail in any room, however, is not just there for show. It's the Honeywell "Round," most distinguished thermostat made anywhere today, the instrument with which room occupants select temperatures of their own choice. In private offices, classrooms and hospital patient-rooms, in hotels and motels and scientific laboratories, in rooms of all types the "Round" fulfills the final function of a building as effective shelter, as a space enclosed for pleasant living and fruitful work.

More Than Meets the Eye

Behind these visible thermostats are complex systems of air conditioning equipment whose operation must be separately controlled. For many public rooms, too, such as lobbies or open work-areas, temperature is selected remotely, by a supervisor at a central control headquarters.

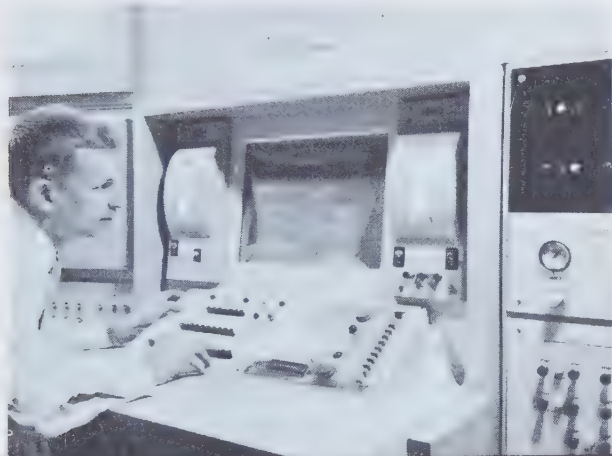
With such behind-the-scenes control this book is concerned. Centralized supervision and operation, first introduced by Honeywell, has revolutionized air conditioning. It provides better control and at the same time decisively reduces operating costs. In engineering and producing the equipment which has made it possible, the same high standards prevail as those that made the Honeywell "Round" such a hallmark of quality.

See how this is so. These pages take you behind the scenes in important buildings where Honeywell centralized control is at work. They take you to the nation's only factory devoted entirely to the production of such panels. Because the building you're planning deserves the best, it is to be hoped this brochure will show you why you too can benefit not only from quality up front but from quality throughout.

Uncluttered-desk approach saves space, increases operator-efficiency.

HONEYWELL'S SELECTOGRAPHIC* CONSOLE

First Selectographic Console went into service at St. Mary's Hospital, Minneapolis, in 1958. Below: Operator adjusting temperature or damper position watches a meter calibrated to show the extent of whatever change he is making.



Honeywell's Selectographic Console has brought to centralized air conditioning a whole new concept—the ultimate in compact efficient operation.

A picture's worth a million words and, in centrally controlling any air-conditioning, a picture of each subsystem is as essential as a road map to a tourist. But no longer do floor-space and wall-space have to be taken up with a permanent array of a building's floor plans or with diagrams of its various fan-systems. No longer is the operator of a sizable building distracted by always being faced with everything at once. Instead, with a Selectographic Console, he works from an uncluttered desk.

Diagrams and floor plans, with key letters or numbers marking the locations of temperature check-points and control-points, are photographed on 35 mm slides, stored in automatic projector. Touching a button brings any required diagram or plan to a 12x18" screen directly in front of the operator.

To check or adjust any temperature, just select the floor or system you want. As its slide appears on the screen, its check-points, control-points and start/stop switches connect automatically with your console. For example, you select the floor plan of the 26th floor. As you touch the buttons for floor plan 26 and the diagram for that floor appears on your screen, the control points shown on the diagram are automatically connected with the operating buttons on your console. As you shift to another floor or fan system, your connections do, too. It's all done simply and efficiently through the Honeywell Multiplexer,* a special multiple relay that permits handling the entire operation with minimum wiring.

Select from your diagram the keyletter of any location you want to check, then touch the corresponding

button on your console. Temperature at that location appears on a precision indicator. Touch another button if you want to raise or lower your control-setting. A meter keeps you posted on how much adjustment you're making.

Audio Monitoring Completes the Job

It was the Selectographic Console, too, that first introduced Honeywell's technique of audio monitoring. Before an operator at a Selectographic starts a fan, pump or compressor, he presses a button on an intercom panel which connects him with where it's located. He listens. He's there, as if he'd made the trip himself. And he knows his equipment is functioning properly. If not, he cuts it off and sends a man to correct the trouble before it causes damage.

Thus at a neat desk-cabinet—only four feet wide, four high, and two deep—he's in complete command. His basic console is usually supplemented at sides and top with matching two-foot modules. On them are shown and/or recorded such crucial refrigeration and boiler conditions as really deserve continuous indication. This way, everything's within arm's reach—accurate, orderly, efficient.

For All Buildings With Ten or More Fan-Systems

With a single Selectographic screen and an Audio Monitor, a single supervisor can see and hear, can operate and measure and adjust the operational conditions of as many as 50 different floors or fan systems. In still larger buildings, he can have twin-screen consoles, with twice as much capacity and only one foot more of width. New York's Chase



*Trademark



Manhattan Building, for instance, uses two of these, enabling its operators to check and adjust temperatures at as many as 1,400 different locations.

With its capacity for saving hundreds of square feet of panel-space, the Selectographic technique is virtually a must for maximum efficiency in large buildings. But though originally conceived for big jobs, Selectographic Consoles have proven so valuable that leading engineers now specify them for large and smaller alike. Any building with ten or more fan systems benefits from the uncluttered efficiency, the convenience and the space economy which are available only with a Honeywell Selectographic.

Typical of all of today's Selectographic Consoles is the one below at the Santa Clara County office building.





Skilled operator guides stylus for reverse-engraving of modules for a Supervisory DataCenter. These panels are well suited to buildings of medium size such as the General Mills office building (SDC, left, below) or to smaller ones such as the Shreveport Club (right).

Quality Backed by Experience:

HONEYWELL SUPERVISORY DATACENTER*



On Supervisory DataCenters, system diagrams are displayed with engraved Plexiglas† panels permanently mounted. Such permanent display is highly suited to buildings with fairly few fan systems to show or with several identical layouts permitting use of one diagram for all and an accompanying panel of push-buttons and adjustment-knobs.

Today, over 800 buildings of all sizes throughout the world are enjoying both better control and more economical operation as a result of centralization on a Honeywell Supervisory DataCenter. Assets such as sequence motor control or data-logging, being hailed elsewhere as NEWS!, have long been producing valuable results on actual, in-service Honeywell panels.

Today's diagram-panels are an outcome of Honeywell's early experience in centralization. In the middle fifties, Honeywell experimented with such graphic techniques as painted wood and enamelled metal before settling on today's handsome and practical surfaces. Now, sheets of rugged Plexiglas, in sizes modularized for economical assembly, are engraved

*Trademark

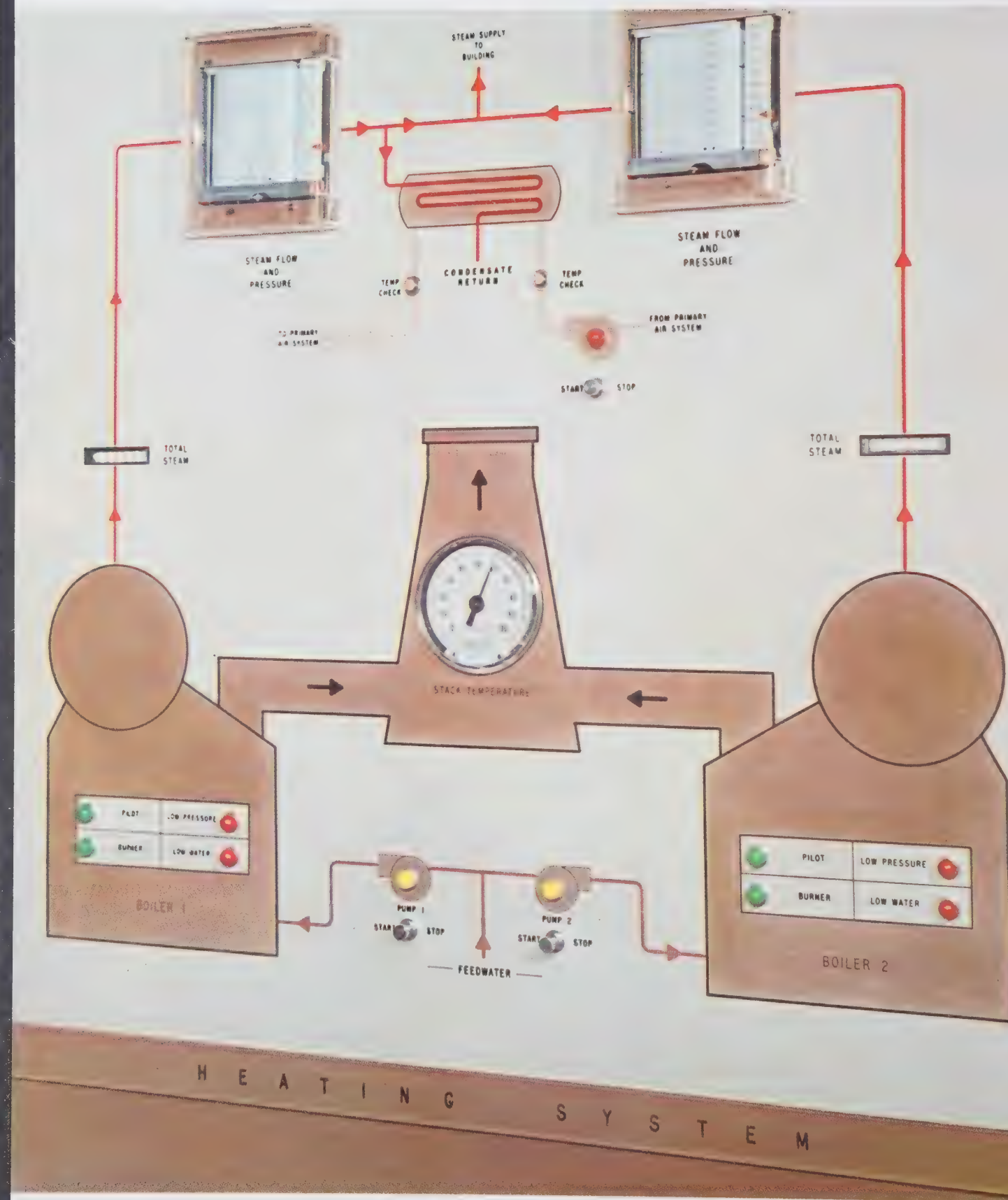
†Trademark, Rohm & Haas Co.



on their under sides and color-coded. The result is a smooth handsome front surface and a clear, readily comprehended diagram that does not wear off or get soiled. Through years, these panels look fine.

Except for using these permanent panels instead of a slide-projector to show floor-plans and system-diagrams, Supervisory DataCenters offer the same operational features as Selectographic Consoles. You can use audio-monitoring. You get continuous indication of crucial boiler and refrigeration conditions with uncluttered, one-at-a-time indication of any others you want to check. And you get the unequalled accuracy of precision industrial instruments.

Probably more valuable, though, than all of the separate construction-assets of making your central control headquarters a genuine Supervisory Data-Center is the overall asset of reliability founded on experience. Every design feature and construction technique of a DataCenter by Honeywell is backed up with more experience in centralization than is offered by all other manufacturers combined.



The smooth handsomeness of easy-to-maintain Plexiglas on a Supervisory DataCenter is captured in the closeup of a heating-system module above.



Concentrate on the job at hand with Honeywell's

TEMPERATURE SCANNING and SELECTIVE INDICATION

Whether your building uses a Supervisory Data-Center or a Selectographic Console, your Honeywell central panel represents the summation of seven years' leadership and progress in centralized temperature indication—in knowing what's going on in your system as a whole. You benefit from Honeywell's unique combination: automatic monitoring plus selective indication.

Automatic Monitoring Frees Operator

Until now, air-conditioning operators have usually checked their temperatures every hour or two and logged them. From now on, much of this routine will tend to disappear. Automatic monitoring will take its place.

A few of the finest buildings on this continent have been benefiting for years from Honeywell's logger-scanner which automatically checks all temperatures at regular intervals and types them out as they are

scanned. Now, though, Honeywell's revolutionary new ScanAlarm* Operations Monitor brings the advantages of automatic scanning within the reach of any building with centralized operation.

Each ScanAlarm is a compact unit, 6½ inches high by 23 inches wide, which is readily mounted on Honeywell's central panels and stands 24-hour guard over as many as 100 temperatures, pressures, or other variables. It is connected to normally-open switches at the various check-points, and when conditions are normal it involves no use of power, no wear, no moving parts. When any variable goes off-limits, however, a switch is closed and your ScanAlarm Operations Monitor goes into action.

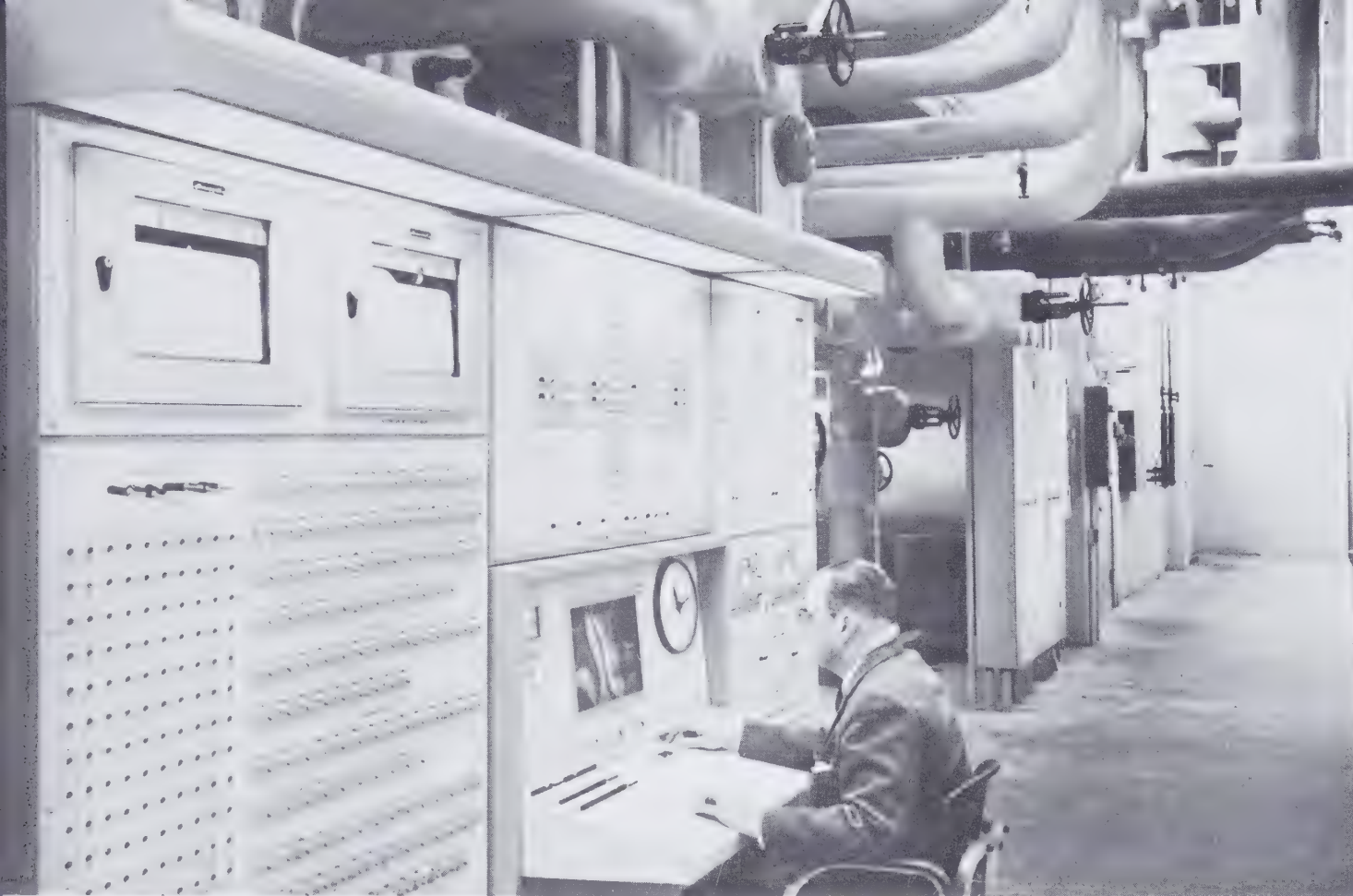
Immediately it sounds an audible alarm, and within a fraction of one second it scans all of its 100 variables. As it spots which variable is off-normal, it indicates its location on an annunciator. A glance at the annunciator tells you where to take corrective action.

When conditions are normal again, the annunciator clears itself automatically. ScanAlarm starts actively scanning only when conditions depart from normal and stops automatically when they are restored.

Supervises Startup and Changeover

For example, when you start up your system or shift it over from nighttime to daytime operation, you simply shut off the audible alarm. Your ScanAlarm begins scanning all its variables, and whatever temperatures have been set off-limits by the changeover are indicated on the annunciator. As each one comes within the limits of its daytime setting, its light goes out. When all lights are off, the buzzer sounds again to let you know you've settled out to daytime limits. You switch the audible alarm back to its normal setting and are ready once more against any trouble.

*Trademark



Round-the-Clock Temperature Check

With automatic scanning, instead of a look-see every hour or two, you get around-the-clock protection—automatically. You know at all times that your system is performing properly without taking time out every so often to make sure that it is. If it isn't, you're notified immediately and are told where the trouble is.

Temperature-Checking Eliminates Complaints

Experience with Honeywell centralization shows that frequent temperature-checking permits correcting off-normal conditions before they're noticed by building occupants. Where centralized control has been added to existing buildings, frequent checking has proved able to eliminate over 95% of former complaints about discomfort.

Now, with ScanAlarm, you can enjoy not just frequent but constant checking, all without taking your operator away from other maintenance duties in the area. ScanAlarm is the most revolutionary combination of good control with economical operation since Honeywell introduced the central-operation concept in 1954-5. It can be added to Honeywell Selectographic Consoles without additional trunk wiring and with Supervisory DataCenters requires only two additional wires for every ten points scanned. It's yours for a fraction of what you pay for any remotely comparable system, and, until now at least, it's exclusive with Honeywell.

Selective Indication Increases Accuracy and Efficiency, Reduces Space Consumption

With your Honeywell ScanAlarm telling when and where to check temperatures, your Honeywell selective indication gives you those temperatures with

the greatest accuracy and efficiency on the market. Selective indication—proven by experience in over 800 buildings—puts in front of you the temperatures you're really working with, keeps the rest "filed away for ready reference."

On Honeywell panels, the only temperatures or other variables that are continuously shown are those you *want* to have shown—such crucial factors as boiler pressure or refrigeration temperatures. The rest you see *when* you want them and as accurate *as* you want them. A touch of a button brings them one at a time to a true precision indicator. This way, you get precision instrumentation for all your variables, many times more accurate than when you have to depend on air gages, whether marked in pounds or degrees Fahrenheit.

One-at-a-Time Readings Reduce Human Error: Studies by the US Air Force have underlined the importance of reducing to a minimum the number of instruments with which any operator is faced. Selective indication does just that.

Expanded Scale Is Easier to Read: Honeywell's precision indicator not only is many times more accurate than any continuous indicator but it also provides the operator with means for being more accurate as well. Its temperature-scale is enamelled on a 32-inch drum, so each 10 degrees is spread over a full 1½ inches. The result is unsurpassed readability.

Single Indicator Saves Space: With Honeywell's single precision indicator, central temperature-checking is really centralized. Small push-buttons supplant the virtual acreage of air gages which is needed when all temperatures are continuously indicated.

Foolproof Sensors Save Money: Thermocouples or resistance-elements offer the most accurate temperature sensors known to man. (Bureau of Standards uses them to check the Fahrenheit scale.) But they're also simple and inexpensive, with no moving parts to wear out. Their use with Honeywell panels permits investment in precision instrumentation at a total cost lower than that of less accurate constant indication.

Quality goes behind the scenes.

HONEYWELL'S NEW FAN ROOM PANELS

*carry throughout your entire system
the trim, handsome efficiency that begins at your central panel*

Your Honeywell Supervisory DataCenter or Selectographic Console is the out-front star in the air conditioning of your whole building. Many architects have brought air conditioning "up from the cellar" by displaying their central control rooms through picture windows opening off of lobbies or main corridors.

Now, though, the same trim orderliness that creates such favorable impressions in these operations-centers is made easier than ever before to obtain for even the outlying equipment rooms of your building. An ideal approach is offered by the newest product of Honeywell's complete panel factory—the Fan Room Panel which is pre-planned for step-by-step installation.

Engineers and contractors are enthusiastic about this new panel because of its modular construction. Item by item, it goes in just as you need it. Architects give it *their* seal of approval for handsome, trim appearance.

When time comes for roughing in the panel, Honeywell delivers to the job just a ring-frame for each panel unit, 24 inches wide by 32 inches high and 7 inches deep. Knockouts in the rings permit easy wiring connections between units, using factory-wired plugs.

*These are assets from this
ring-around start:*

It's light—one man can handle it with ease.

It's immediately available when wanted—stocks will be maintained at all of Honeywell's 112 offices, bringing one near to your jobsite.

It's simple—keyhole slots make it easy to mount, flush-recessed or on the surface, with either end up, permitting door to open either right or left.

It's modular—two or more of these units are easily ganged, fastening together with conduit nipples and wing nuts to produce larger panels. Knockouts in the rings permit easy wiring between units, using factory-wired plugs.

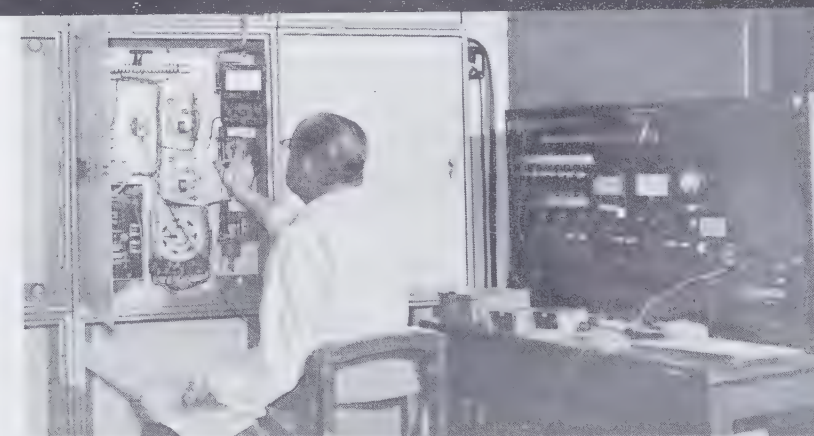
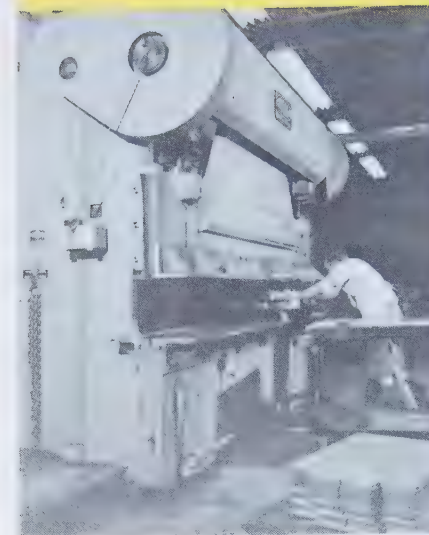
It's safer from damage—narrow strip of exposed metal is less subject to bangs or scratches during building's construction period and can easily be covered with tape if desired.

Then when the job is ready for its controls, it gets them. They're factory-mounted on a subpanel which forms the back of the cabinet, and, when suitable, on the door. Back panel slips onto machined supports in the ring-frame and is firmly held with a wing nut. Wiring is readily connected to numbered terminal strips.

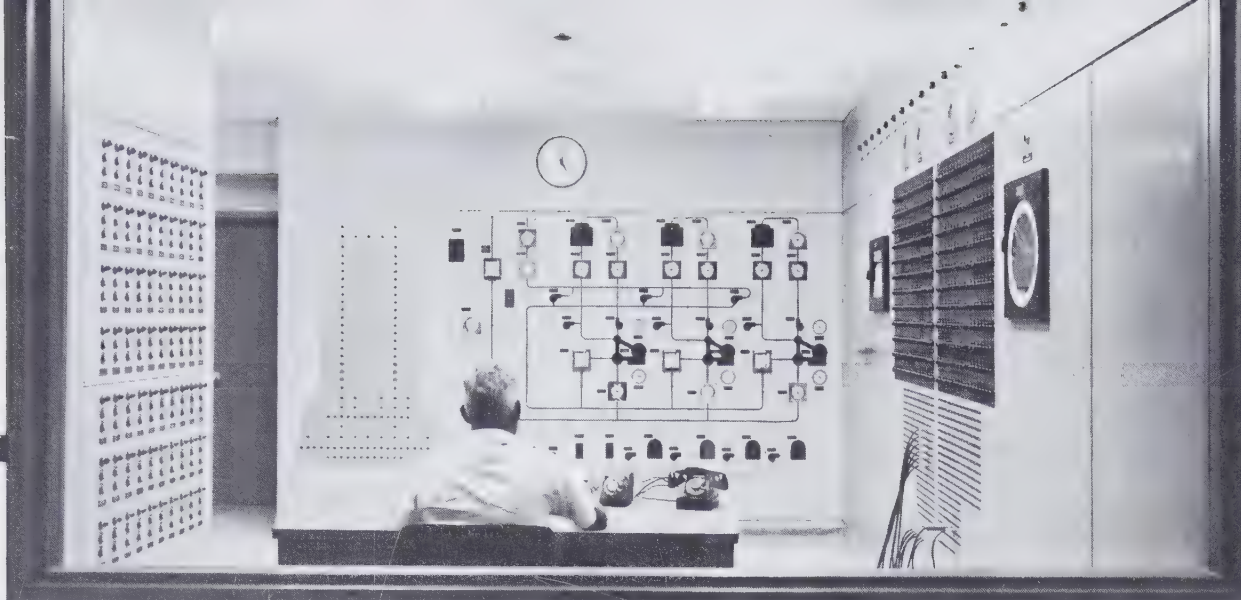
Finally, the door goes on without tools, thanks to T-formed hinges. In—up—and down—it's secured, and it closes with roller catches or lock and key. It's available as a single piece or with a two-thirds, one-third division which combines permanent covering for terminals with ready access to dials or switches. When desired, gages and/or switch buttons can be made accessible from outside the door, without opening it.

The finished job, enamelled in neat, two-tone grey, gives the same trim appearance to a fan room as is found in a lobby or office. Still, ease and economy of installation plus efficiency in operation and maintenance of its contents make the whole approach a saving instead of an expense. The unitized Fan Room Panel is the final expression of a policy at Honeywell's Panel factory of standardizing on sizes and construction techniques to provide highest quality without high cost. This policy, along with the use of Honeywell's quality controlled components throughout all panels, gives you top value all the way—from the Honeywell Round in the President's office down to the last little switch at work behind the locked-door panel of a remote fan-room.

"Don't penalize your system—panelize it"—with panels throughout by Honeywell, your most complete and experienced panel-resource in the air conditioning field today.



Pre-stamped elements of the basic ring for a Honeywell Fan Room Panel are securely welded together. (Right, top to bottom): Giant press stamps out backplates on which controls will be mounted. Mounted controls get check-out inspection. Finished panels are inserted in special shipping cartons.



Seen through a main-corridor picture-window (at right) in Houston's Bank of the Southwest is the large DataCenter room which was one of the first two central-control headquarters ever built. (Left, below) DataLogger in the control room of Montreal's Queen Elizabeth Hotel.

Built-in quality begins on the boards

HONEYWELL ENGINEERING HAS LED THE WAY



Before quality construction comes quality engineering. This is as true for central control panels as for any technical product. And with Honeywell DataCenters it has meant the whole succession of advances that have brought central control in commercial buildings to its present state of development.

1954—Houston Post Building, first graphically represented, centrally controlled refrigeration system for air conditioning—by Honeywell

1955—Prudential Building, Chicago, and Bank of the Southwest, Houston, first complete air conditioning systems with central indication and control—by Honeywell

1957—Queen Elizabeth Hotel, Montreal, first centralized system with automatic scanning and logging data—by Honeywell

1958—Eastman Kodak, Rochester, and St. Mary's Hospital, Minneapolis, first systems with slide-projected system-diagrams — by Honeywell

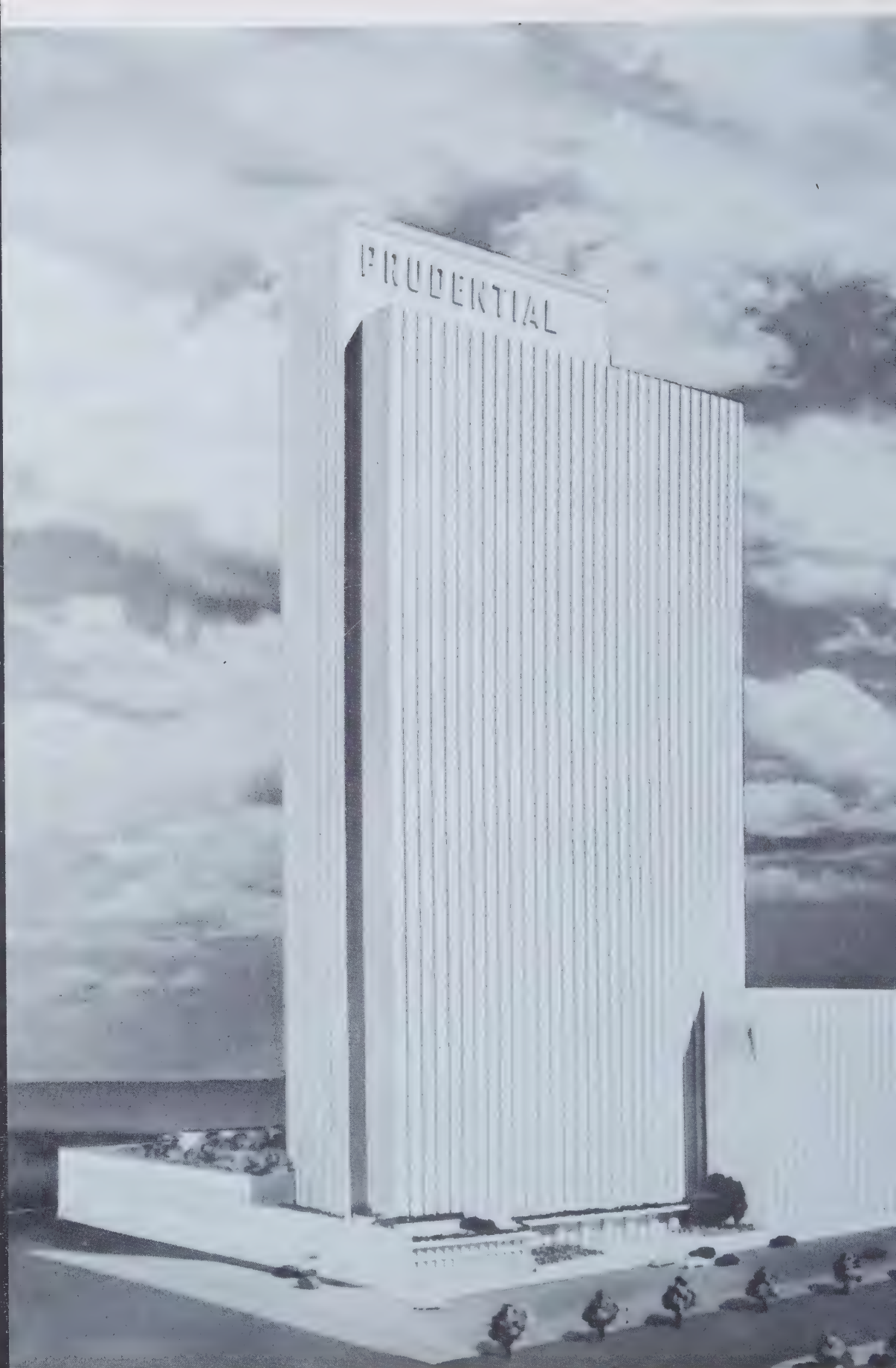
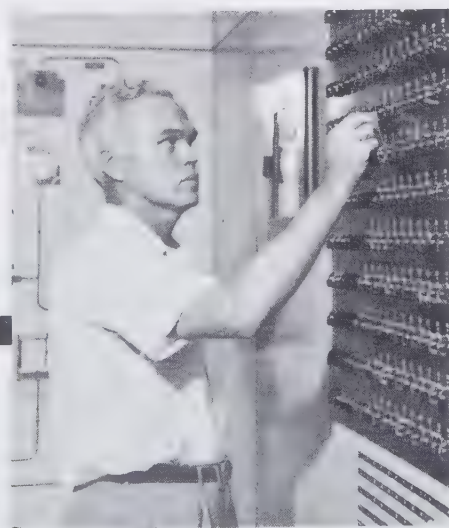
1960—Motorola Building, Chicago, first use of alarm scanning—by Honeywell

One or more of these advances will be incorporated in any Honeywell central panel you may use in your building, whether it be a skyscraper or a small clinic, store or restaurant. Some are still exclusive with Honeywell though others have been imitated.

But what's more important to your building than any individual feature of its Honeywell central panel will be the fact that all those features are backed by the creative Honeywell engineering that launched today's entire approach to centralized operation. The same engineering will be at work for you.



Left: Design engineers confer on details of a Honeywell Supervisory DataCenter in the drafting rooms of Honeywell's Panel Factory.
Below: Supervisor at Bank of the Southwest adjusts one of the many temperatures he has at his fingertips in his Supervisory DataCenter headquarters.





Four Selectographic Consoles are readied for shipment from Honeywell's Panel Factory.

80-ton Wiedeman press stamps out with high speed and precision the heavy-gauge plates for Supervisory DataCenters, Selectographic Consoles and Fan Room Panels.

TO DO IT BEST, DO IT ALL!



Probably no manufacturers of complex mechanical or electrical products ever produce all their components or their raw materials themselves. Still, the more elements made by the manufacturers themselves, the better the end result. It's a philosophy that benefits users in several ways.

Nowhere in the making of central panels for controlling air conditioning can you find this philosophy at work for you as it is at Honeywell. Bolts, wire and sheets of steel, of course, are purchased. The projector and mirror for slides in a Selectographic Console are made by a reliable outside source. Otherwise, your panel is all-Honeywell.

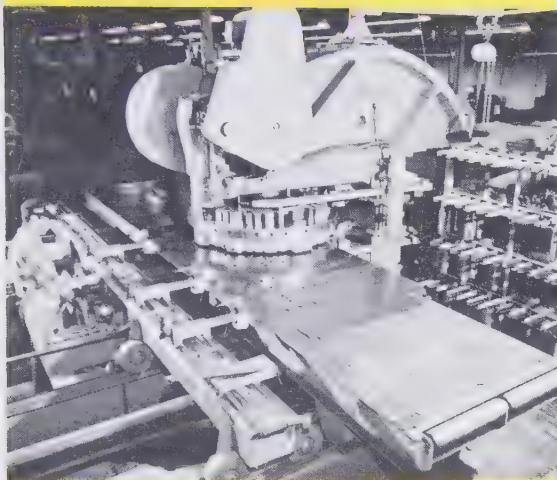
Instead of being "farmed out" to some sheet-metal shop, then wired and hung with purchased instruments or mounted with appliquéd symbols or system-components, your Honeywell panel is manufactured for you as a whole, from start to finish.

Printed circuits for use with Multiplexers for Selectographic Consoles get expert etching at the hands of a Honeywell technician.

Quality Detail, Every Step of the Way

An 80-ton Wiedeman press stamps from heavy gauge sheet steel the walls for cabinets and consoles. These are then stoutly welded together in Honeywell's own shops. System-diagrams for permanent display get custom-engraving and coloring on the reverse side of crystal-clear quarter-inch Plexiglas, presenting a distinguished, easy-to-maintain surface. System-diagram slides for Selectographic presentation are made in Honeywell's own photographic studio.

Most important of all, the elements basic to control of your building—the instruments for measuring and recording temperature or humidity, the multiplex relays, even the basic meters and switches—are all made in Honeywell plants, with Honeywell attention to every detail of accuracy and reliability. When your central panel is a Honeywell, we can be sure that every detail is right—and so can you.



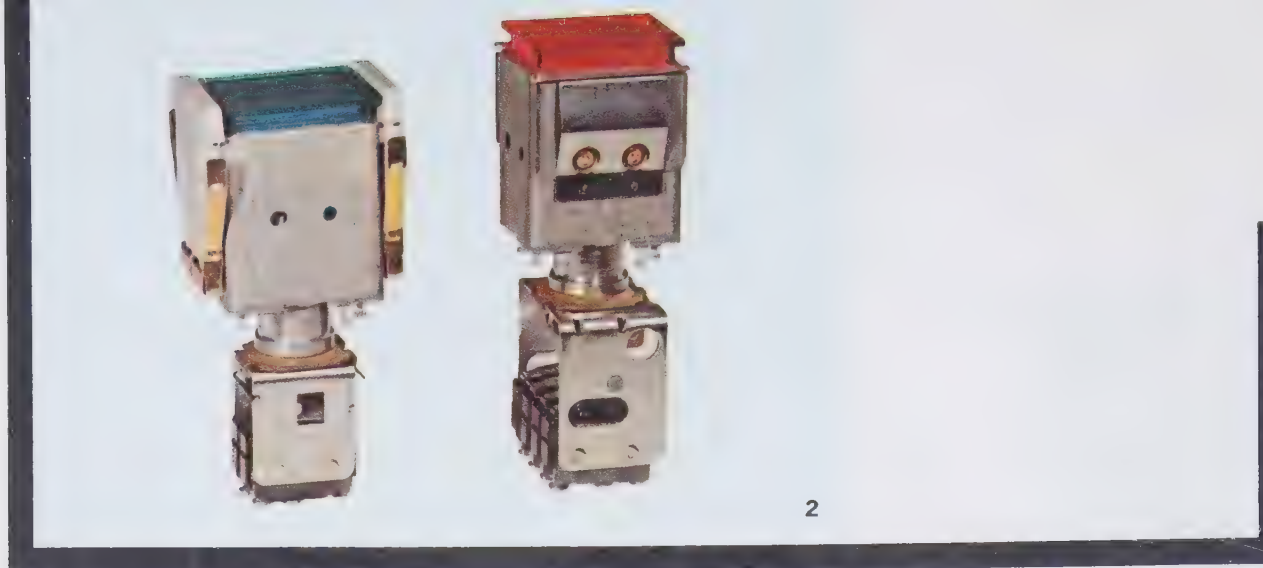
Assets Beyond In-built Quality

Such all-the-way production, such single responsibility not only guards the total quality, the systematic character of your entire panel. It also avoids such delays as result from dependence on outside sources, assures delivery of your panel to the job when your building's ready for it. And Honeywell's tooling up of manufacturing facilities along with versatile use of modular construction permits producing a quality, customized product at a price comparable to those of mere approximations attempted by other manufacturers.

Finally, let's face it, there's the question of replacement parts. No quality on earth attains perfection. And when some contact finally burns out or something else gives way, it's always a help having direct access to your original source of supply. That's what you get with centralized control from Honeywell. Honeywell, not a cluster, stands behind it.



Prestamped halves of the basic ring for a Honeywell Fan Room Panel are placed in a specially-designed jig for welding.



2



3

The whole can't be finer than the sum of its parts. Rely on

ALL-HONEYWELL QUALITY COMPONENTS

in your operational central-control panel.

1. Gages made by Honeywell's Precision Meter Division are widely relied on for life-and-death accuracy in space-age aviation. On your central panel they perform such jobs as measuring damper-positions or raising and lowering temperature set-points. Their use is another contribution to the engineered high quality of Honeywell central panels.

2. Even the myriad of small switches in Supervisory Data-Centers and Selectographic Consoles are Honeywell-made. They're the renowned-for-precision snap-action switches of Honeywell's MICRO SWITCH Division, designed and produced for a lifetime of unfailing repeatability. As many as 500 of them may be used in connection with a single panel.

3. Honeywell's complete data-handling equipment is providing, in the buildings where it is at work, the most automatic, the most effective and the most economical air conditioning available at today's levels of technological advance. Less than 9 square feet of floor space is needed to furnish them with automatic logging, alarm-scanning and digital indication of as many as 160 temperature-points and, where applicable, the addition of one more cubicle provides computation.

4. Brown Multipoint Recorder records up to 12 variables simultaneously for analyzing system performance to improve total efficiency. Electronic construction provides twice as many channels as are offered on all-pneumatic panels.

5. Another Brown Instrument on your Honeywell panel is the indicator which provides precision readings for the various temperatures in your system which require only selective indication. Such precision selective indication is decided improvement over continuous indication such as was used on Honeywell's earliest panels. Overall use of continuous indication, whether read in pounds-pressure or degrees-Fahrenheit, depends on an air gage which can offer only a fraction of the precision provided by instrumentation-grade indicators.

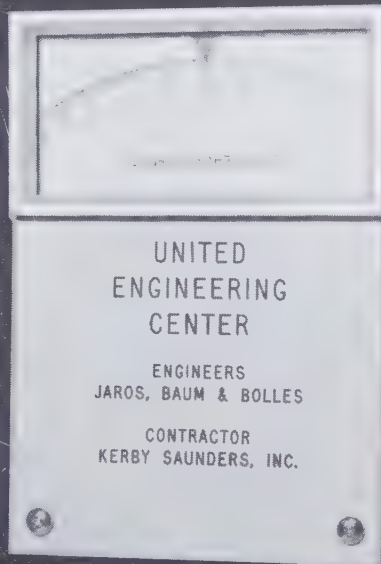
6. Brown Instruments, the foremost name in precision instrumentation, contribute not only to the prestige but, more importantly, to the accuracy of your Selectographic Console or Supervisory DataCenter. The miniature Tel-O-Set* recorders of Honeywell's Brown Instruments Division provide unsurpassed accuracy in continually indicating, controlling and recording the crucial temperatures, pressures and humidities of your boiler and refrigeration system. Their construction is more compact than that of similar recorders and contributes to the trim, modern appearance of your panel.

**Trademark*

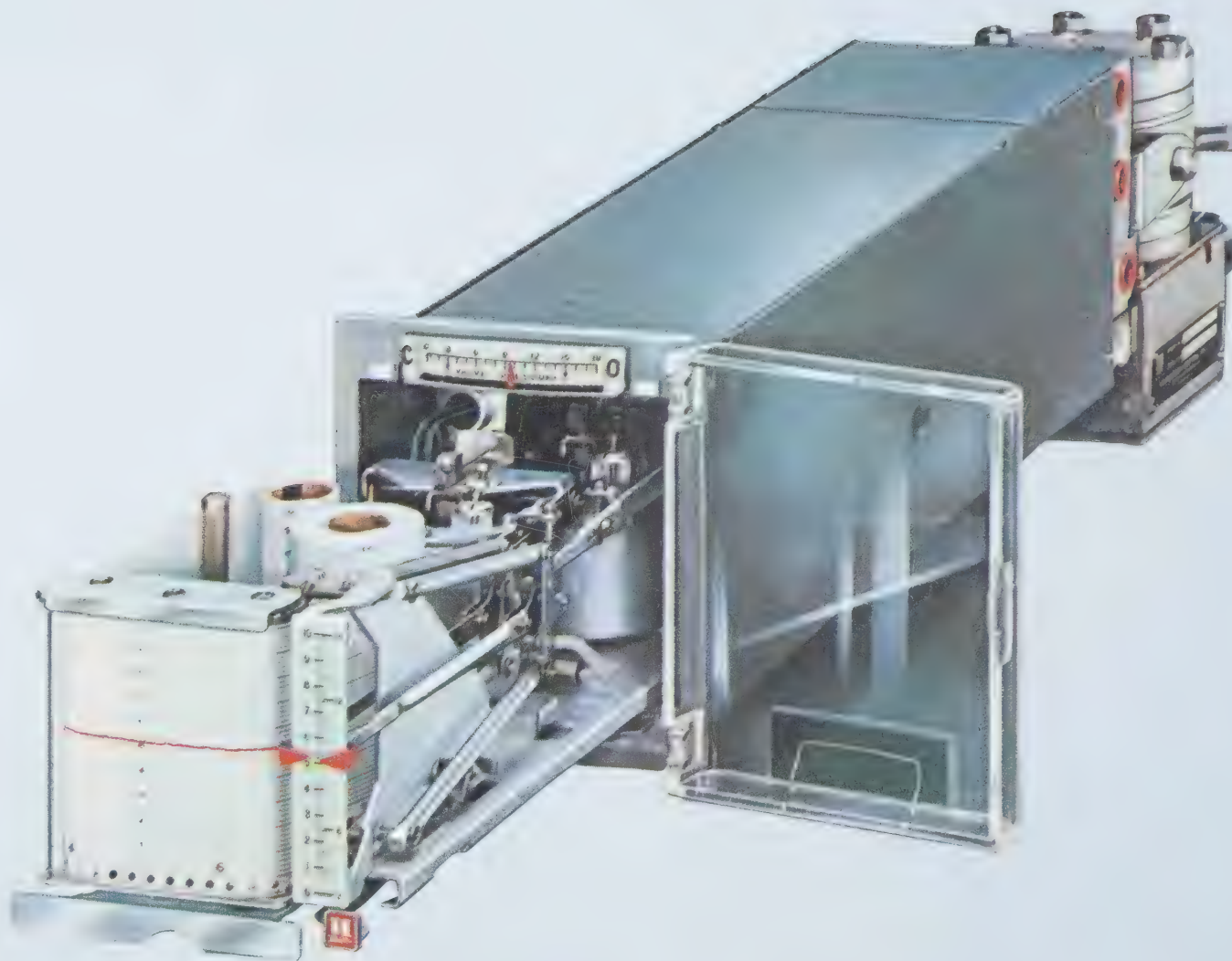


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4




5



Your third source of satisfaction is four types of service:

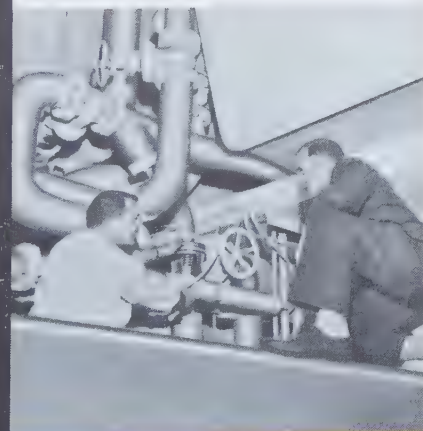
HONEYWELL FIELD SERVICE

backs your central panel in four valuable ways.



As you can see, you're a long way ahead with a Honeywell Selectographic or Supervisory Data-Center for two basic reasons: First, Honeywell makes all the major components in these control centers. Second, the control centers themselves are fully engineered and actually manufactured as a whole in the only complete factory anywhere devoted to this type of product.

These two factors work together. Because Honeywell can rely on our own proven components, our panel factory is able to standardize on them and on the sizes and shapes of the steel enclosures or backplates into which they are built. Within these standards you're able to plan a panel which will offer finer performance than your budgets could otherwise buy and will still be entirely customized to efficient operation of your particular building.



A third asset that is yours with every Honeywell system is service. "Honeywell field service" does not just refer to the 112 offices which bring Honeywell sales and maintenance personnel within ready reach of any installation. It also covers Honeywell's unique policies and practices which make any Honeywell system a care-free system from the time of its planning right on through the decades of its serviceable life.

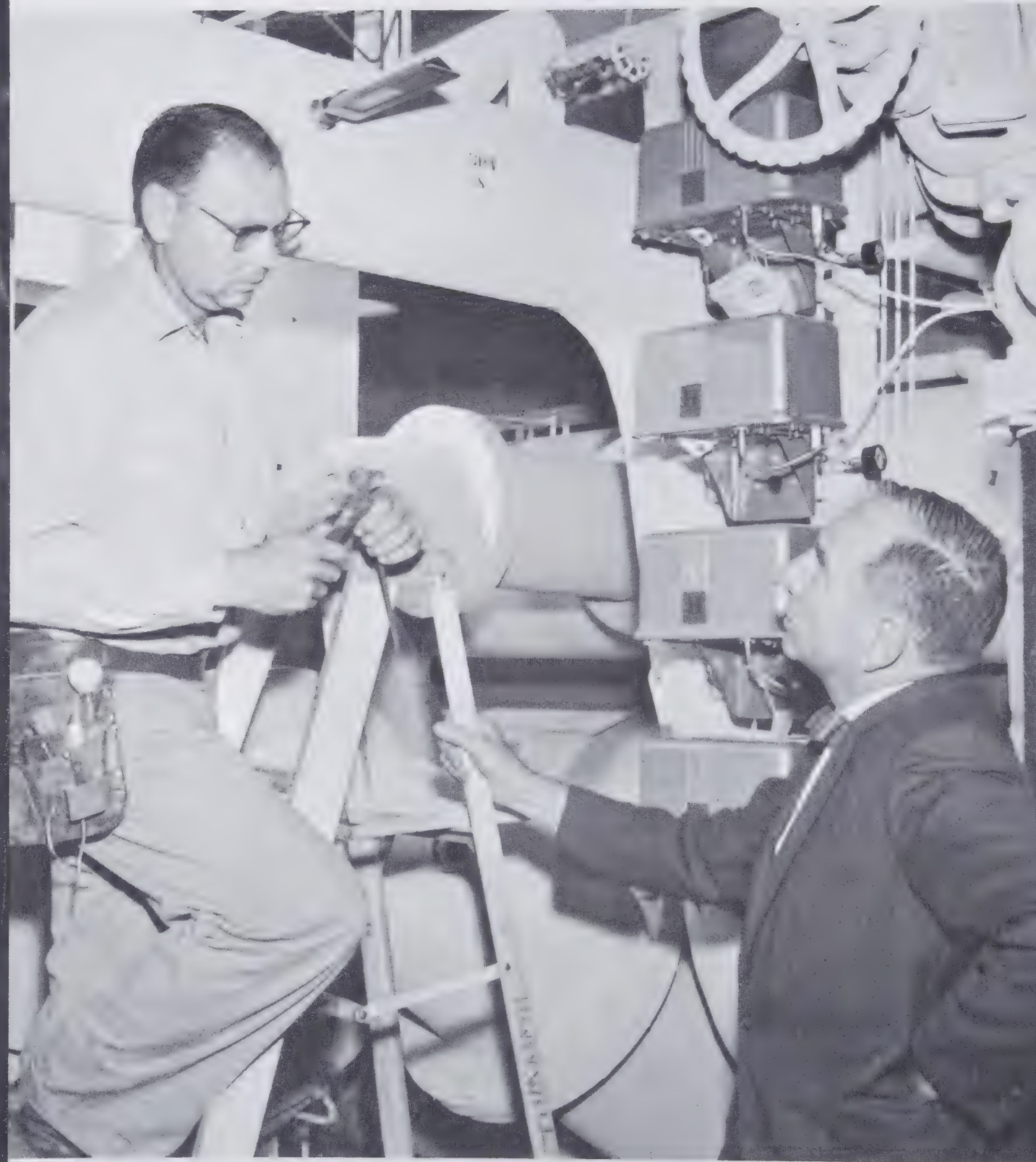
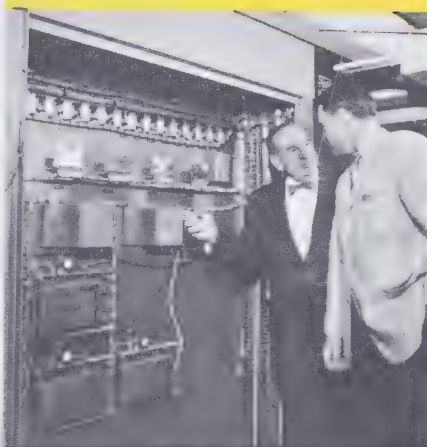
Here are the four important factors that add up to Honeywell Field service:

HONEYWELL FIELD ENGINEERING: Honeywell specialists work closely with architects and their engineers in the planning of any Honeywell system.

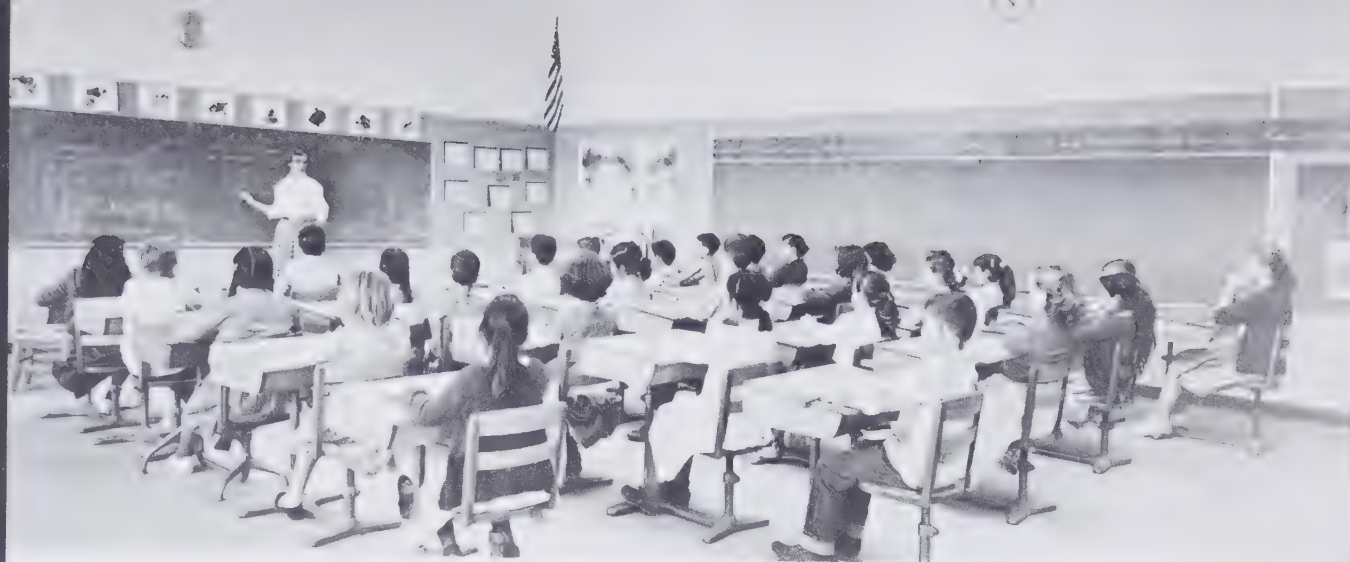
HONEYWELL SUPERVISION AND INSTALLATION: Honeywell specialists are right at the job-site during installation of any Honeywell system. Questions relating to special control circuits and other important control subjects are answered quickly and correctly. Time saved means money saved for the contractor. When installation is completed, Honeywell checks it out, adjusts it and helps correct any faults.

HONEYWELL SERVICE GUARANTEE: Honeywell services the equipment during the contractor's guarantee period, assists the owner in matters of early operation, and thus relieves many headaches of the shakedown period in a new or remodeled building.

HONEYWELL MAINTENANCE CONTRACT: Those responsible for efficient building operation have found that a maintenance contract signed with Honeywell not only relieves them of concern with a specialized system but also saves money by forestalling breakdowns and reducing wear. Regular inspection and trouble-preventing maintenance are provided by factory-trained experts.



Engineer Francis Adams enjoys the satisfactions of Honeywell field service at every step of the progress from initial planning to final completion of the Santa Clara County office building.



(Left)

Natural daylighting is combined with automatic control from Honeywell's Light Saver* system to economize on power costs in Sequoia School, Manteca, California. Lighting is just one of several electrical systems now centrally controlled from Honeywell panels, either separately or at the same station from which air conditioning is supervised.

*Trademark

(Left, below)

Comparatively recent example of advances in the use of electronic data-processing with centralized control for air-conditioning is an overhaul/maintenance depot at Dorval near Montreal. Building went into service for Trans-Canada Air Lines in 1960, but Honeywell has been making electronic data-loggers and using them in such systems since 1957. Data-logger equipment can be seen at the left of the control room shown here.

Centralized air conditioning is only the beginning.

CONSULT WITH THE EXPERT

If your sole concern is the centralization of control for your air conditioning you are well advised to discuss it with control experts. The relationship of a central control panel to the present or eventual size of your building . . . decisions on permanently mounted panels versus slide-projected system-diagrams . . . the virtues of alarm-scanning or, for outstandingly fine buildings, of automatic logging . . . these and similar subjects merit deliberate, experienced evaluation.

To such a discussion, no one can bring either as much experience or as much objectivity as can Honeywell. The experience is grounded in those 800 buildings in which Honeywell has already installed central control headquarters and from which has been gleaned more experience than that of all other manufacturers together. And the objectivity is based on the fact that Honeywell—and only Honeywell—makes all approaches to the techniques of centralization. Discussion and recommendations can thus be based on the specific needs of your building and the best possible answers to those needs.

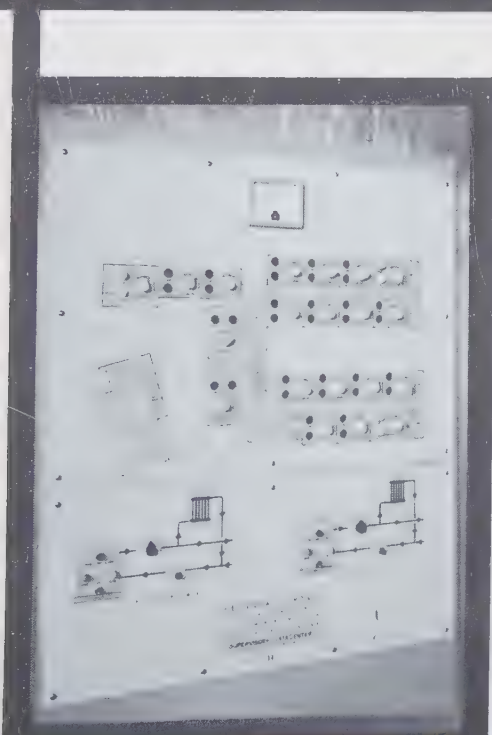
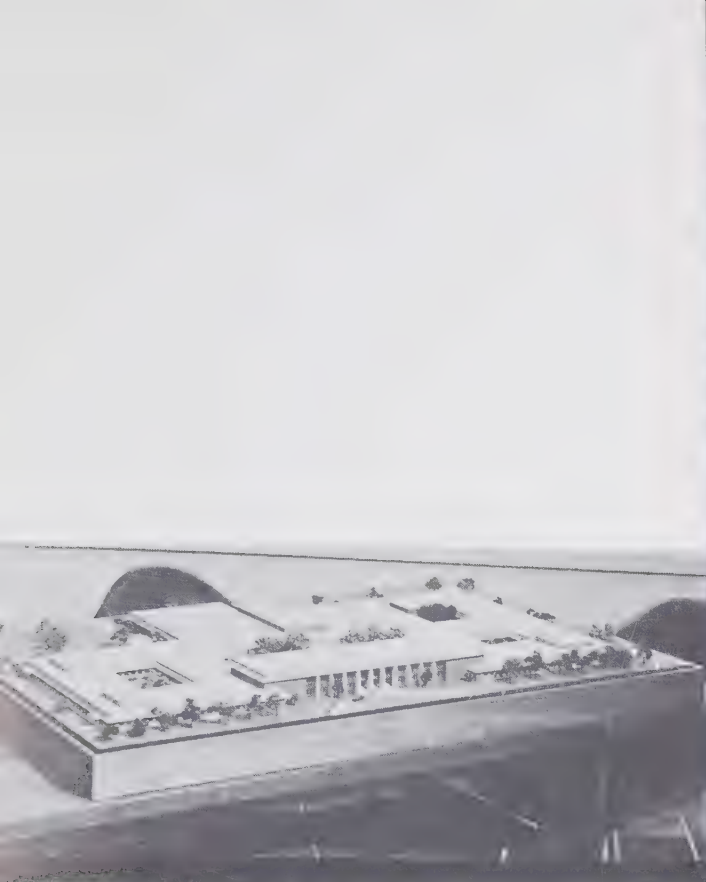
There's more to centralization, however, than just air-conditioning control. Today's thoroughly modern

building makes its central control station a truly operational headquarters for the entire structure.

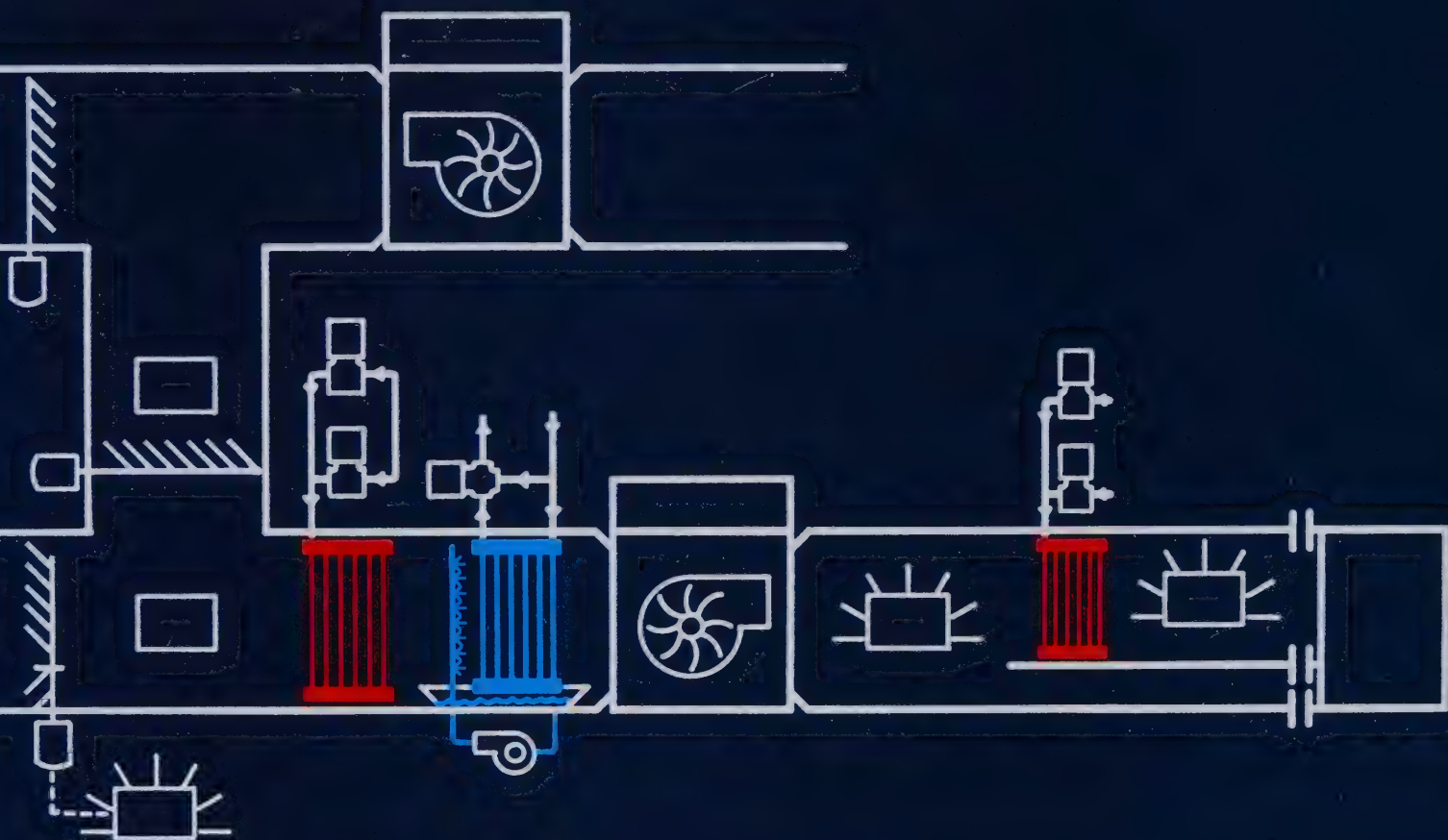
Fire alarms, master-time and programming systems, light-control security systems, surveillance of crucial equipment . . . all these functions can be centralized at the same panel as air-conditioning control. The Pure Oil building outside Chicago, for example, has the zone lights for its fire alarm and security systems mounted on diagrams of the building as modules of its central operational panel. When fire breaks out or intruders break in, the operator doesn't have to remember where zone 3 is to locate the trouble. It's identified for him immediately by his diagram. And the same programmer that coordinates his building's clocks serves also to program the start-up and operation of his air-conditioning system.

Honeywell, and again only Honeywell, makes all these other operational systems. Your building can benefit from them and from their centralization on an all-inclusive operational panel. Discuss them with your Honeywell representative. Plan on letting them contribute to the modernness of your building, because your building deserves the best.





Systems for fire alarm, security and master time and programming are all centralized in the Selectographic Console of the Pure Oil office building near Chicago. Architect's model of the building is left, above, and the Console is directly above. Also shown here is the supervisory panel for air conditioning and for the Light Saver system at the Sequoia School.



SUPERVISORY DATACENTERS
SELECTOGRAPHIC CONSOLES
SCANALARM OPERATIONS MONITORS
LOGGER-SCANNERS
FAN ROOM PANELS

Honeywell
First in Control
H HONEYWELL SINCE 1906

THE CONTROL THAT **REVOLUTIONIZED** AIR CONDITIONING IS **NEW** ALL OVER AGAIN!

NOW, COMPLETELY
TRANSISTORIZED

MARK IV

ELECTRONIC / PNEUMATIC
TRANSDUCER



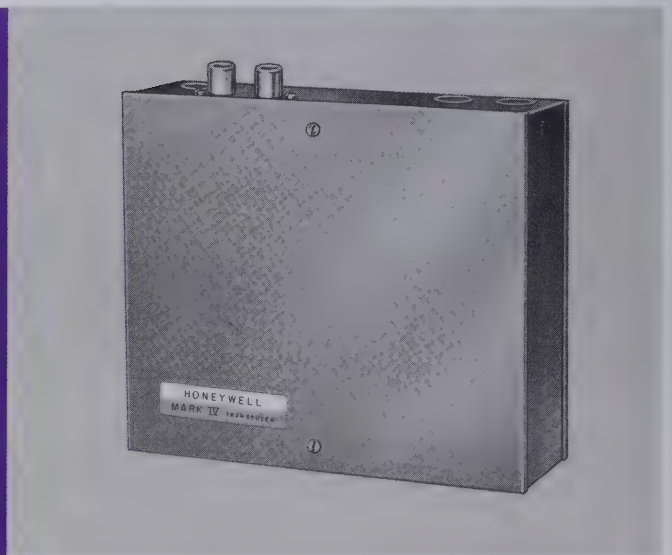
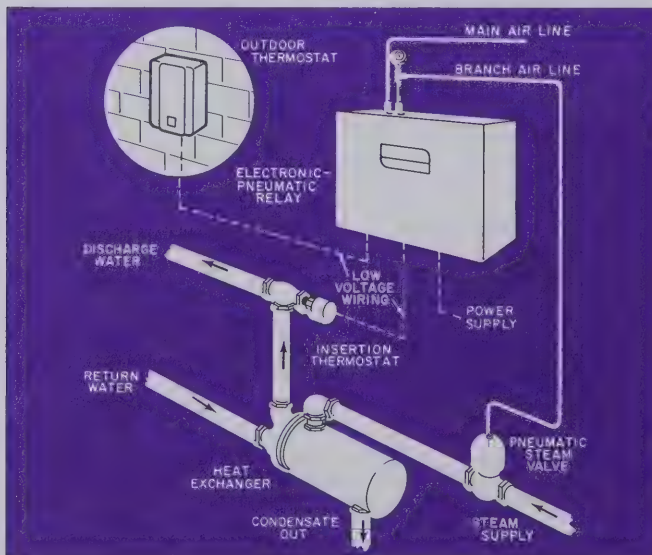
Your newer, still better approach to combining the assets of electronic and pneumatic control:

MARK IV TRANSDUCER

It was Honeywell's electronic/pneumatic transducer that first made possible the revolutionary centralizing of any building's entire air-conditioning operation at one supervisory panel. Over 800 of the most important buildings in the country have used this device to advantage in the past five years.

Two subsequent models have already followed the original link between electronic sensors and pneumatic valves or damper motors. But Honeywell hasn't stopped there. Now comes the Mark IV—a thorough redesign that makes combining the advantages of electronics and pneumatics easier and more effective than ever. If you haven't used these advantages in your system, now's the time.

The diagram below shows how the basic control hook-up closely parallels that of conventional master-submaster systems, while offering the convenience of centralized system set up, checking and adjustment.



The Best of Both

Mark IV combines electronic flexibility and speed with pneumatic stability and reliability.

Economical

Mark IV saves money in centralized control by handling multiple functions over each pair of wires instead of using pneumatic tubing with one signal to a tube.

Quick and Easy

Where two or more thermostats work as a team, Mark IV permits setting up their operation or changing it with a fraction of former time and effort.

For today's systems, the ideal combination

Pneumatic power is solid, stable power. Pounds of pressure on every functioning inch—it's the workhorse of commercial control. Nothing yet has been found to provide more reliable year in, year out performance than a well-made pneumatic valve or damper motor.

But when you're teaming up two or more thermostats

—one resetting another—or when you're controlling your building from a central panel, the best and easiest way to control that valve or motor is with electronic thermostats. That way, you keep your pneumatic stability and still get the speed, reliability and flexibility that comes from thermostats with no moving parts.

To achieve this ideal combination of pneumatic and electronic control, you need a transducer. And today's transducer—Mark IV—is the best yet.

The way to centralized operation

It was Mark IV's great-grandfather, Honeywell's first electronic/pneumatic transducer, that introduced today's era of centralized building-operation. For centralization electronics offered four benefits: 1) With electronic/pneumatic control, you eliminate those long-run air lines that run up costs by demanding a separate tube for

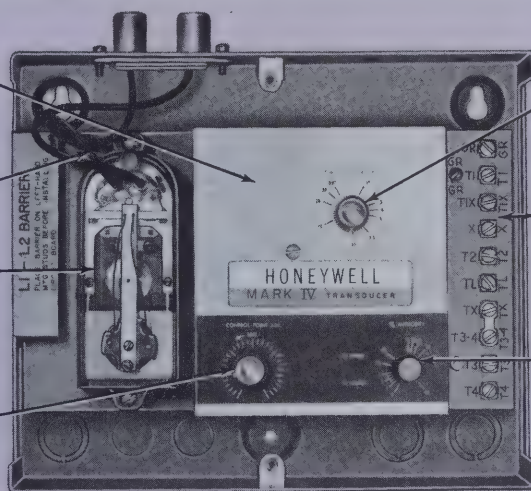
each signal. (With electronics, one pair of wires handles many functions.) 2) You lick the lag that long-run pneumatic lines introduce into many systems and that some users find hurt performance. 3) You get precision readings from a high-precision instrument instead of an air-gage marked in Fahrenheit. 4) You touch a button to get the reading you want instead of studying a maze of gages that clutters up your panel.

Bridge and Amplifier Unit: Receives signals from thermostats, amplifies them, sends DC voltage to transducer proper.

Air Tubes: To pneumatic valve or damper motor.

DC to PSI Transducer: Converts amplified voltage to 3 to 13 pounds of air-pressure.

Control-Point Adjustment Knob: For adjusting thermostat's set-point at the transducer.



Throttling Range Selection Knob: Offers completely free choice of throttling ranges—1° to 30°F.

Terminal Strip: Easily accessible—with each terminal clearly marked.

% Authority Knobs (Coaxial): Tamper-protected and key-operated. Adjust the effectiveness of duct and/or outside thermostats in relationship to room thermostat.

The way to thermostatic team-up

When two or more thermostats work in combination, you get another whole set of advantages from an electronic/pneumatic transducer. They all apply whether an outdoor thermostat is resetting supply temperature or space temperature—or a duct 'stat is being used to cushion against temperature-shocks and overshoot from heavy load-changes.

A two-controller team, for example, can be calibrated

and adjusted for interaction with just four steps instead of the seven that go into working with pneumatic thermostats. They're all carried out right at your Mark IV transducer instead of chasing back and forth between thermostats. Simple knob-setting replaces screwdriver-and-air-gage work in inconvenient locations.

And with electronic thermostats and a transducer you have complete flexibility in your control range. The throttling range of each of your thermostats is adjustable right at the Mark IV panel.

HERE ARE THE NEW FEATURES OF HONEYWELL'S BETTER-THAN-EVER

MARK IV ELECTRONIC PNEUMATIC TRANSDUCER

Transistorized circuitry assures you of long-life performance—no tubes to replace.

Advanced design has made settings easier to read.

Two authority-knobs have been combined into a coaxial, key-operated setting-post, capped with plastic to discourage tampering.

Wiring and other installation procedures have been simplified.

Offers ready change-over from direct-acting to reverse-acting control.

Entire unit is modularized so that a rough-in box is installed during the initial building-phase and the control panel follows later with easy wiring and plug-in air connections.



BUILDING AUTOMATION CAN SAVE
YOUR CLIENTS THOUSANDS OF DOLLARS

How much automation is practical for buildings?

AN ANALYSIS MAY SURPRISE YOU. EVEN IN BUILDINGS OF MODEST SIZE, THE RIGHT DEGREE OF AUTOMATED CENTRAL CONTROL OF BUILDING FUNCTIONS CAN PAY FOR ITSELF QUICKLY . . . PROVIDE SAVINGS YEAR AFTER YEAR.

Many reports to Honeywell confirm that by cutting costs and boosting efficiency, automated central control of building functions often pays for itself in as little as five to seven years. Also it's now very simple to automate only the systems you

need, in any combination, to attain the highest operating efficiency. Some of the systems that can be automated are:

TEMPERATURE AND HUMIDITY CONTROL, EQUIPMENT SURVEILLANCE, SYSTEM ANALYSIS, DATA LOGGING, FIRE ALARMS AND SECURITY SYSTEMS, CLOCKS AND PROGRAMMING SYSTEMS.

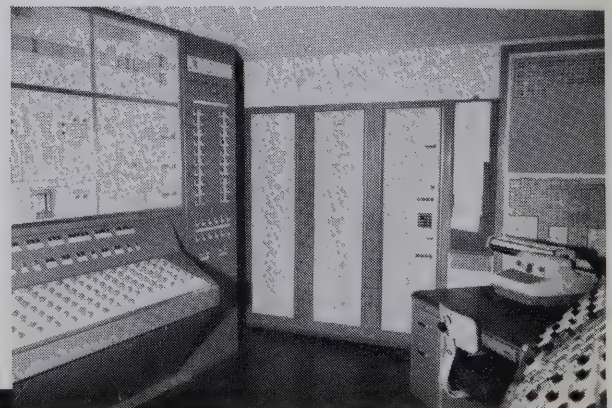
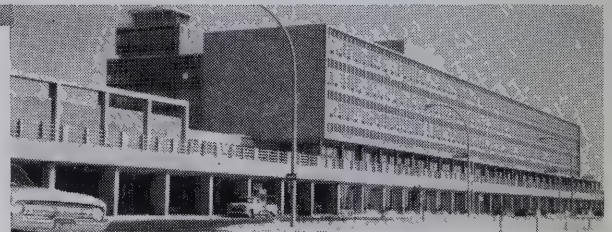
Regardless of the type of building—office, store, factory, school, hospital or hotel—some degree of automation will produce

tangible savings . . . will keep a tighter rein on operating costs.

SOME NEW BUILDINGS ARE OBSOLETE BEFORE COMPLETION.

Despite the advances in building automation techniques, three out of four commercial buildings going up today lack automated controls, and may be operationally obsolete before completion. It's a fact that a modern building, with up to 50% of its cost represented by electrical and mechanical systems, is as much a machine as it is a structure. As a machine, it can now be *automated*

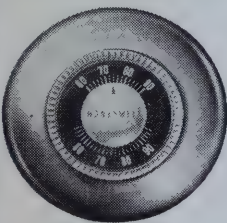
AUTOMATION AT MONTREAL INTERNATIONAL TERMINAL, DORVAL, permits operator at this Honeywell Supervisory Data Centre to centrally control, check and set a variety of complex building systems. These include automatic scanning and logging of 490 temperature check points, control of the ramp de-icing system, walk-way lighting systems, 54 fan systems, 39 humidity-controlled areas and 134 electronic thermostats. Alarms on 130 check points indicate by audio and visual monitors when temperature is too high or too low. Without centralized automation, the operator would require two days to check and record all 490 temperature points alone.



far more than most people realize, especially those who pay the bills for its operation and maintenance.

While automation can be added later, it will naturally cost more. In the meantime, "hidden" costs must be paid. Honeywell studies of non-automated buildings repeatedly show that air conditioning and other costly systems run needlessly for two to four hours overtime each day. Operators need that much time to start and stop the machinery. This wastes power and fuel, shortens equipment life and fails to make the most effective use of manpower. All these waste factors can be eliminated by centralized automated control, where, in a few minutes, all building functions can be checked at a control panel. It's a simple fact that many building owners are paying for automation whether they have it or not, *and actually paying more if they don't have it!*

BUILDING AUTOMATION BEGAN WITH TEMPERATURE CONTROL.



The principal of this famous Honeywell Round thermostat is fundamental to building automation. It is, in fact, basic to

automating many industrial processes and even to the function of space guidance systems.

As a pioneer in the field of automation, Honeywell is best equipped to supply the right control systems properly integrated for optimum results. And only Honeywell makes all three types of control systems—pneumatic, electric and electronic.

HONEYWELL MINIATURIZATION SAVES COSTLY SPACE.

Central control panels built and installed by Honeywell take up minimum space. For example, Honeywell's Selectographic DataCentre takes up little more space than an office desk. It uses graphic plans, rear projected from 35 mm slides on a TV-like screen, permitting one operator, within minutes, to start machinery, note pressure and temperatures, and know that alarms can automatically pinpoint trouble. Modules built by Honeywell can be added to tie-in all other building systems. In this way, the centralized control centre becomes a custom installation at production-line prices.

AUTOMATION SIMPLIFIED BY SINGLE RESPONSIBILITY.

Honeywell will work with you to

analyse the services you wish to automate . . . to establish which systems are on the fringe or beyond it. We'll also establish the precise degree of automation that will quickly pay-off for your clients. Then we will help you lay out your system, supply the most suitable equipment, install it and supervise start-up. We will contract to maintain it as a package transaction which includes periodic inspection, emergency service, and parts replacement.

Only Honeywell can impartially recommend any type of combination of systems that will be best for your clients . . . pneumatic, electric or electronic—all guaranteed by Honeywell.

CALL HONEYWELL FOR AN AUTOMATION ANALYSIS.

It doesn't matter if your current project is a new building or the modernization of an old one, call on Honeywell for an automation analysis. In taking this action, early in the planning stages, you will have the opportunity to make your building a model of efficiency—combining architectural and mechanical excellence. The earlier we're called in, the more certain a lower first cost—with greater savings over the building's lifetime. Honeywell Controls Limited, *Commercial Division*, Toronto 17, Ontario.

7 NEW PLANNING GUIDES ...YOURS FOR THE ASKING

Here in these seven booklets Honeywell's latest authoritative developments in Building Automation are described. If you would like to study one or more of these booklets, simply write to Honeywell Controls Limited, Toronto 17, Ontario.



AUTOMATION
TECHNIQUES



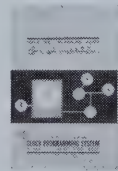
TEMPERATURE
CONTROL



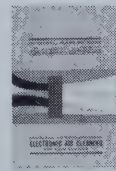
AUTOMATIC FIRE
PROTECTION



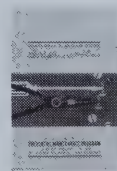
SECURITY AND EQUIPMENT
SURVEILLANCE SYSTEMS



CLOCK PROGRAMMING
SYSTEMS



ELECTRONIC
AIR CLEANING



PREVENTIVE MAINTENANCE
PROGRAMS

Honeywell



First in Control

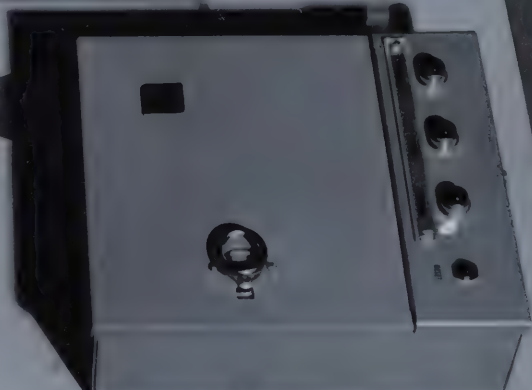
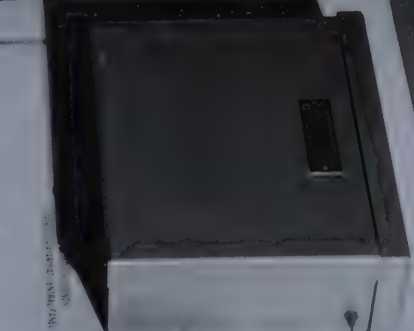
ELECTRICAL

SECURITY

SURVEILLANCE



ELEMENTS OF A SECURITY SYSTEM WHICH DETECTS FIRE AND INTRUSION ALARM CIRCUIT, SHOWING ALTERNATIVE MEANS FOR DETECTION



ELEMENTS OF A BOILER-SURVEILLANCE SYSTEM, AUDIBLE ALARMS SOUND BOTH IN EQUIPMENT ROOM AND AT THE CENTRAL PANEL

ANNUNCIATOR PANEL IN BOILER ROOM INDICATES WHAT ASPECT OF BOILER SYSTEM IS IN ALARM STATUS. THE ALARM AND ANNUNCIATOR UNIT ARE IN THE BOILER ROOM. THE ANNUNCIATOR UNIT IS IN THE CENTRAL PANEL.

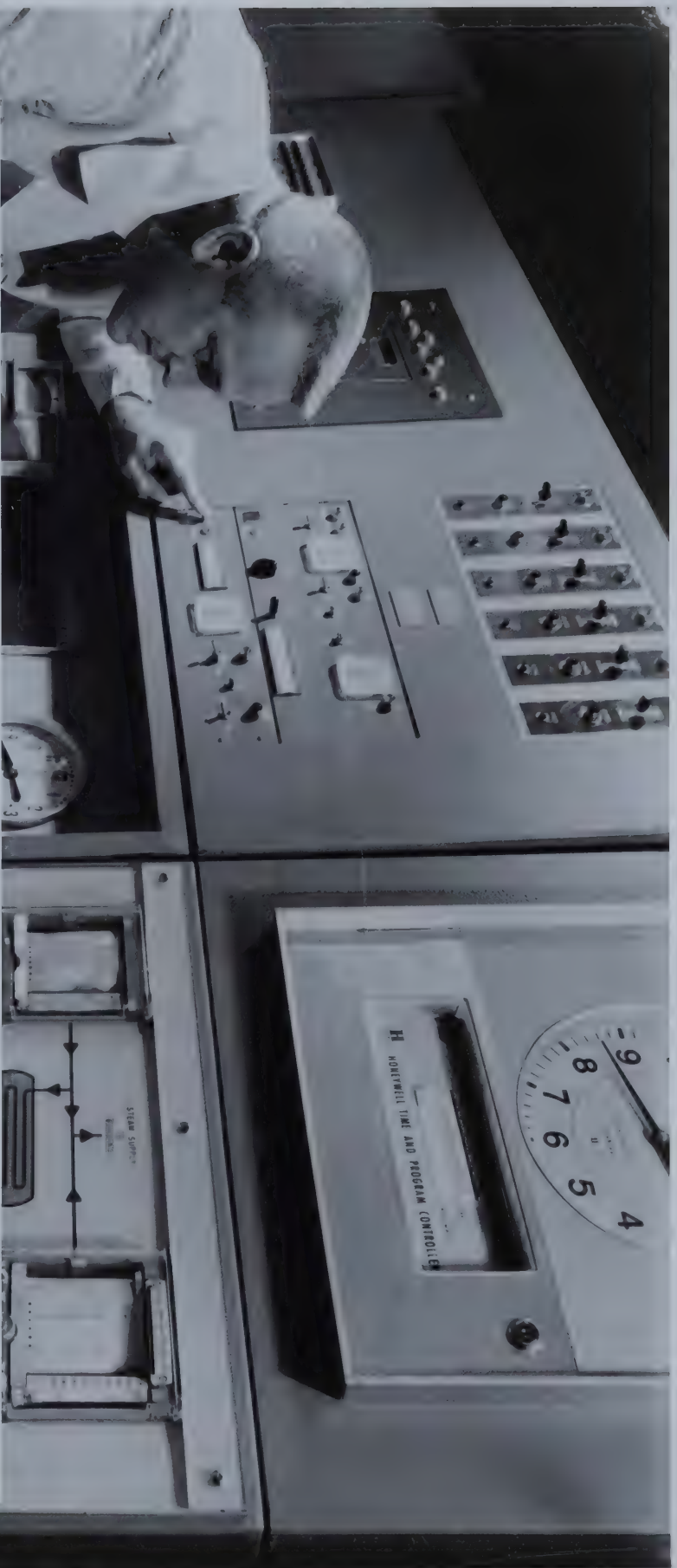
BOILER ROOM ANNUNCIATOR UNIT IS IN THE BOILER ROOM. THE ANNUNCIATOR UNIT IS IN THE CENTRAL PANEL.

ALARM ROOM ANNUNCIATOR UNIT IS IN THE ALARM ROOM. THE ANNUNCIATOR UNIT IS IN THE CENTRAL PANEL.

SENSITIVE HONEYWELL fire detectors turn on alarm at first wisp of smoke or if room temperature rises too fast. Honeywell representative holds electronic heating element used to demonstrate sensor sensitivity in firm's building automation show.

FROM: President of Canada
143 Yonge Street
Toronto, Ont.

For: Honeywell Controls Limited



Building "heartbeat" -- A Honeywell engineer reads information from a striking DataCenter mechanical equipment monitor that takes the "pulse" of an entire building. Besides offering centralised control of mechanical equipment, the DataCenter monitor includes automatic logging and scanning. Temperatures, humidities, pressures, flows and other variables from 100 remote points are automatically logged by an electric typewriter rapping out three-digit "bits" of information every second. A continuous scanner turns on an alarm if any checkpoint is off range. Besides increased operating efficiency the handsome DataCenter adds styling to a building's functional equipment.



ScanAlarm* annunciators for

displayed by

Strip-chart records

or

Systems Analy
Flexible Main

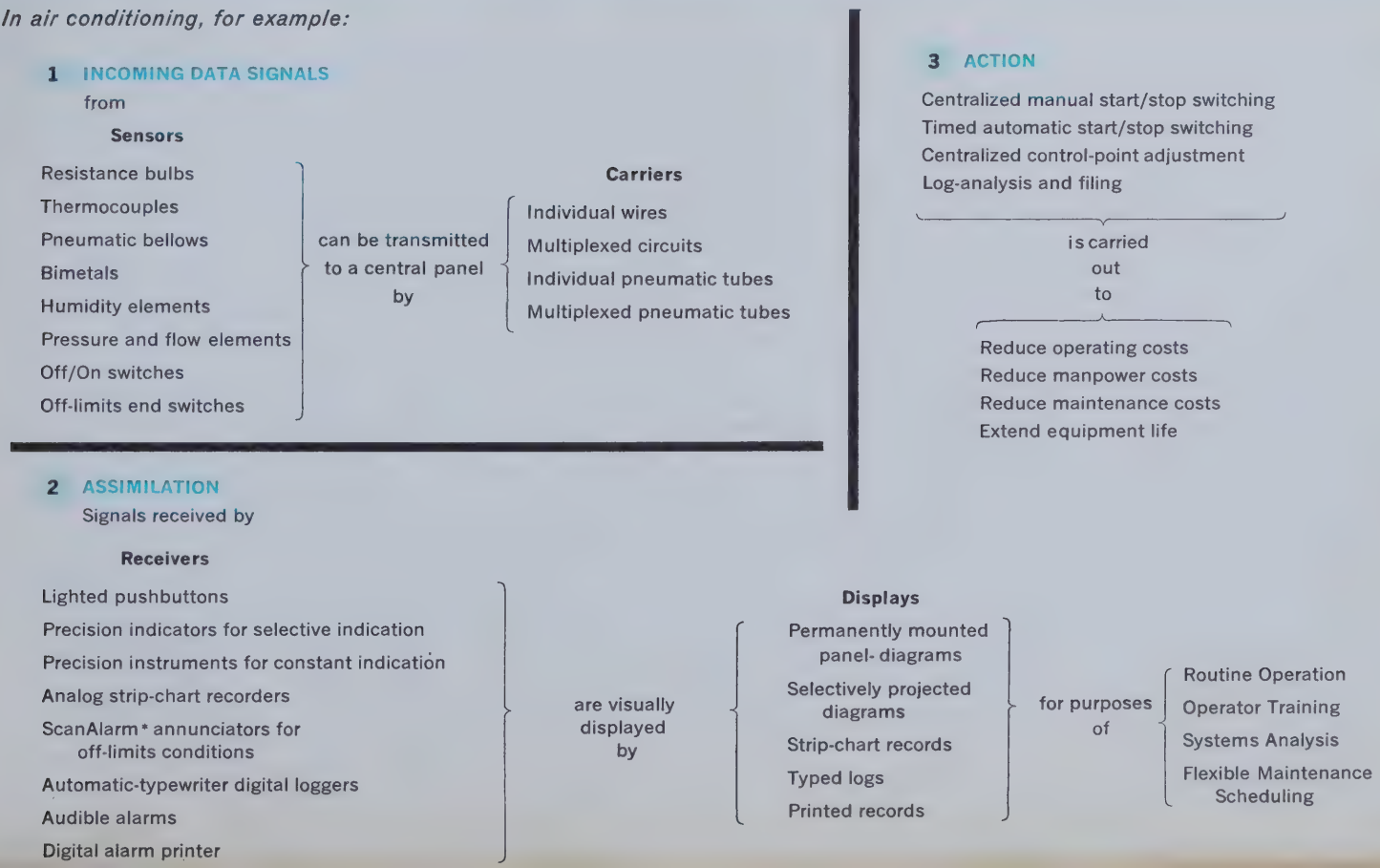
From: Presentation of Canada Limited
143 Yonge Street,
Toronto, Ont.

For: Honeywell Controls Limited

Elements of centralized automation: Honeywell systems deal with all three elements of centralized automation:

- 1 Receiving data-signals
- 2 Assimilating them
- 3 Transmitting action-signals

In air conditioning, for example:



3 ACTION

Centralized manual start/stop switching

Timed automatic start/stop switching

Centralized control-point adjustment

Log-analysis and filing

is carried out to

Reduce operating costs

Reduce manpower costs

Reduce maintenance costs

Extend equipment life

Honeywell



First in Control

keytape

AR27



When environment limits performance, the environment must be changed.



This car costs \$15,500. Under today's driving conditions, its top speed of over 160 miles per hour is often 90% useless.

Superhighways cost millions of dollars. Perhaps they could help this sophisticated machine make full use of its power and speed.



This car costs \$15,500. Under today's driving conditions, its top speed of over 160 miles per hour is often 90% useless.

Superhighways cost millions of dollars. Perhaps they could help this sophisticated machine make full use of its power and speed.

Ferrari courtesy of Auto Engineering Inc.,
Lexington, Massachusetts.





These airplanes cost \$10,000,000 apiece. Cruising speed: 550 mph. Present speed: 0 mph. Following a twenty-minute wait, they may begin their flight.

But the sky has plenty of room, and with a few more strategically placed billion-dollar airports, possibly the planes could get up there more quickly.

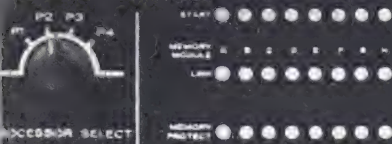


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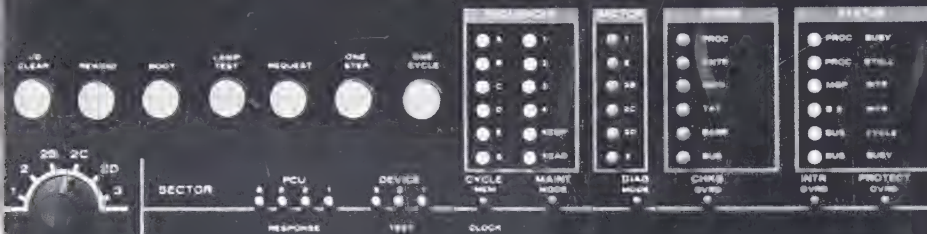
MEMORY BUS CONTROLLED



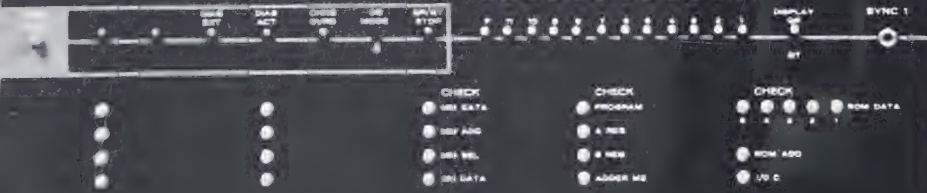
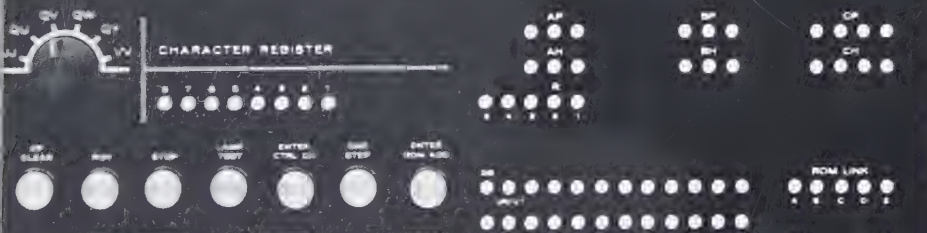
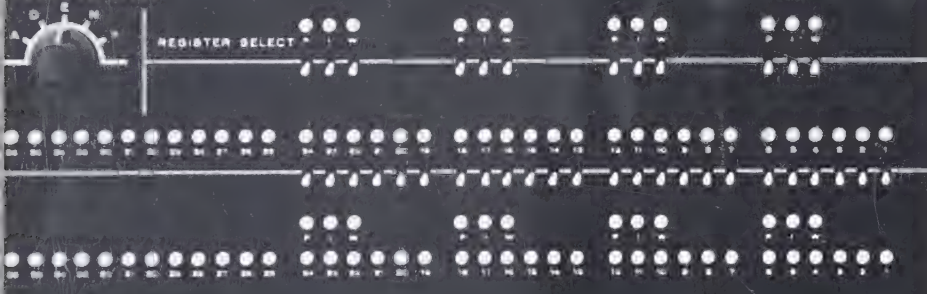
CENTRAL
PROCESSOR
333360

SYSTEM
INITIATOR

INPUT/OUTPUT CONTROLLER



CENTRAL PROCESSOR



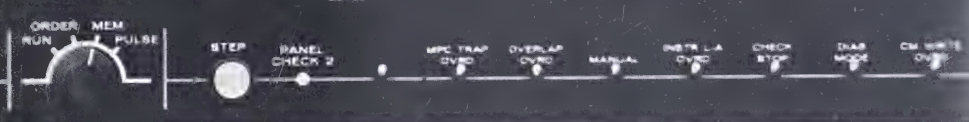
HONEYWELL

8200

SYSTEM POWER CONTROL

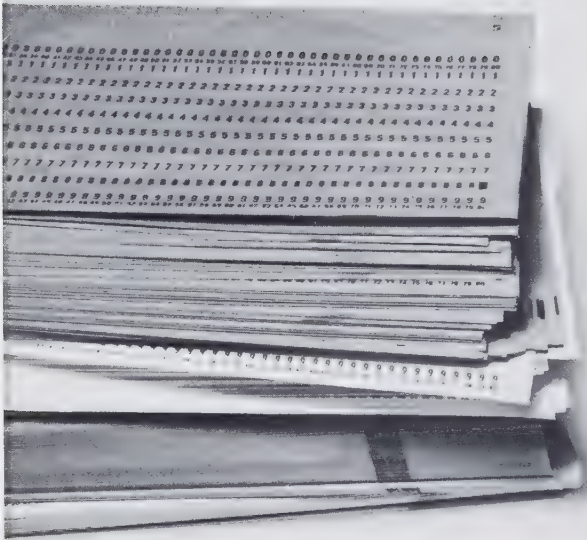


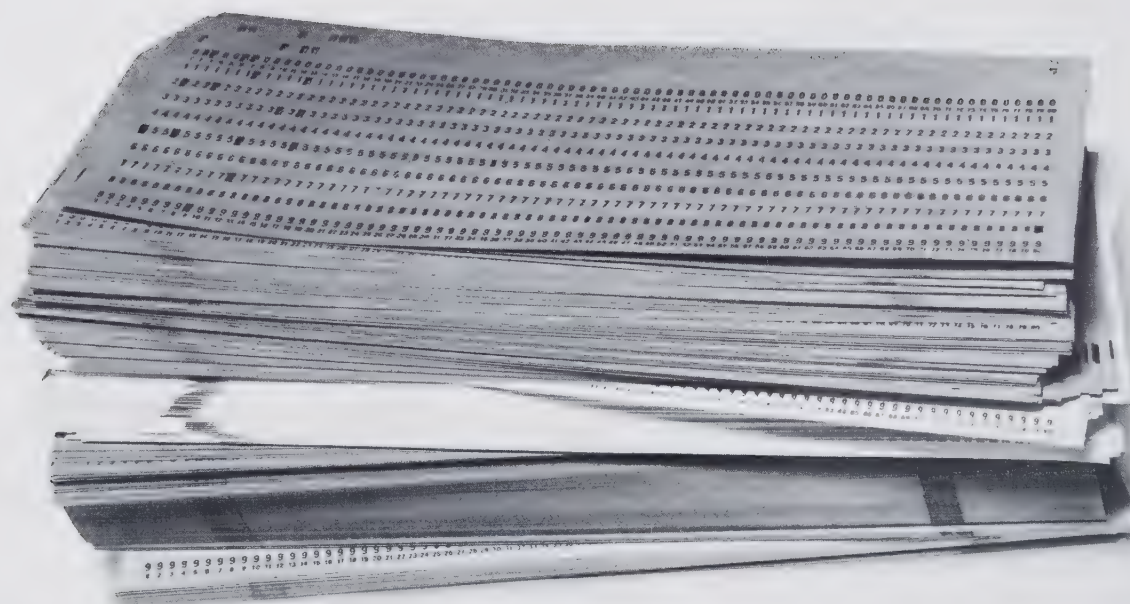
MULTIPLE PROCESSOR



This computer sells for over a million dollars and rents for \$400 per hour. It can move 500,000 characters of information in one second. Currently, it is hardly moving anything; as it ticks away this particular second, its card reader cannot even give it a dozen data cards.

A slow card reader is standing in the way of this computer's high speeds. Slow as the card reader is, it is not the slowest device in the computer's way.







HONEYWELL





PROGRAM

DISPLAY

UPPER
POSITION

UPPER

LOWER

DUP

NSP

SKIP

L ZERO

70

90

STATUS

CHECK

ER-CORR

ER-REL

PARITY

LOWL

L ZERO

HOME

MPC

MPS

TEF

YBS

That's right — KEYTAPE. Designed and built by Honeywell, it combines direct keyboard-to-magnetic-tape transcription and verification in one machine.

KEYTAPE saves money, boosts productivity in data preparation, and clears the input traffic jam.

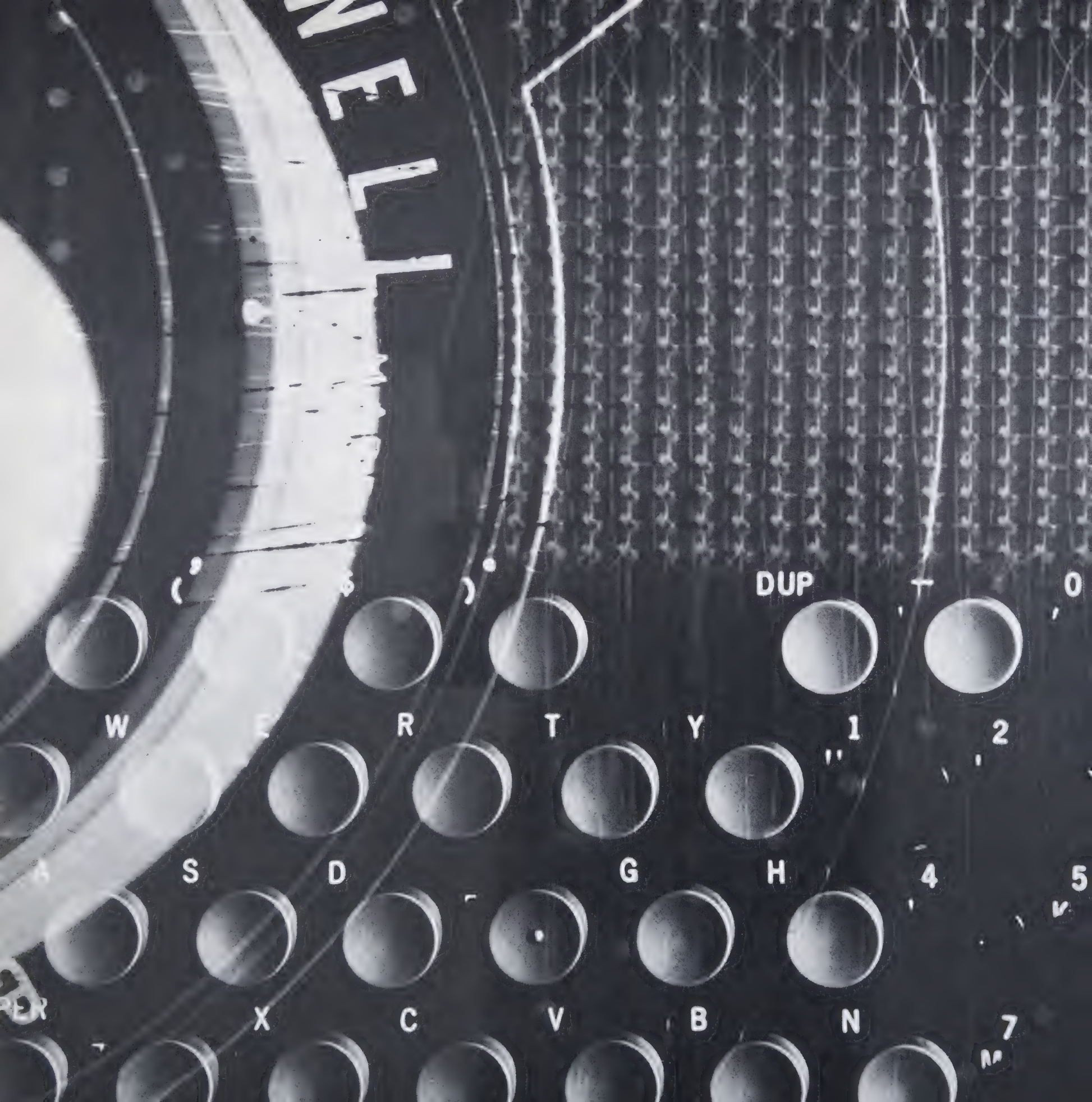




KEYTAPE saves space formerly required for verifiers. KEYTAPE saves time formerly required for separate verification and insertion of correction cards. Time, especially computer time, is money.

And because KEYTAPE input can be read by a computer at tape-drive speeds rather than card-reader speeds, you save more time. And because 3 KEYTAPE devices do the work of 4 keypunch /verifier combinations, you save more space. And because 3 operators cost less than 4, you save more money.





With its own magnetic core memory, KEYTAPE's internally stored formatting programs help bring data preparation into line with the capabilities of today's computers — computers which read tape input 600% faster than card input.

At the same time, the "human engineering" behind KEYTAPE makes for unprecedented simplicity of operation. After setting a single 5-way switch to the correct KEYTAPE operating mode, the operator can record, verify, or search for data merely by keying the proper characters.

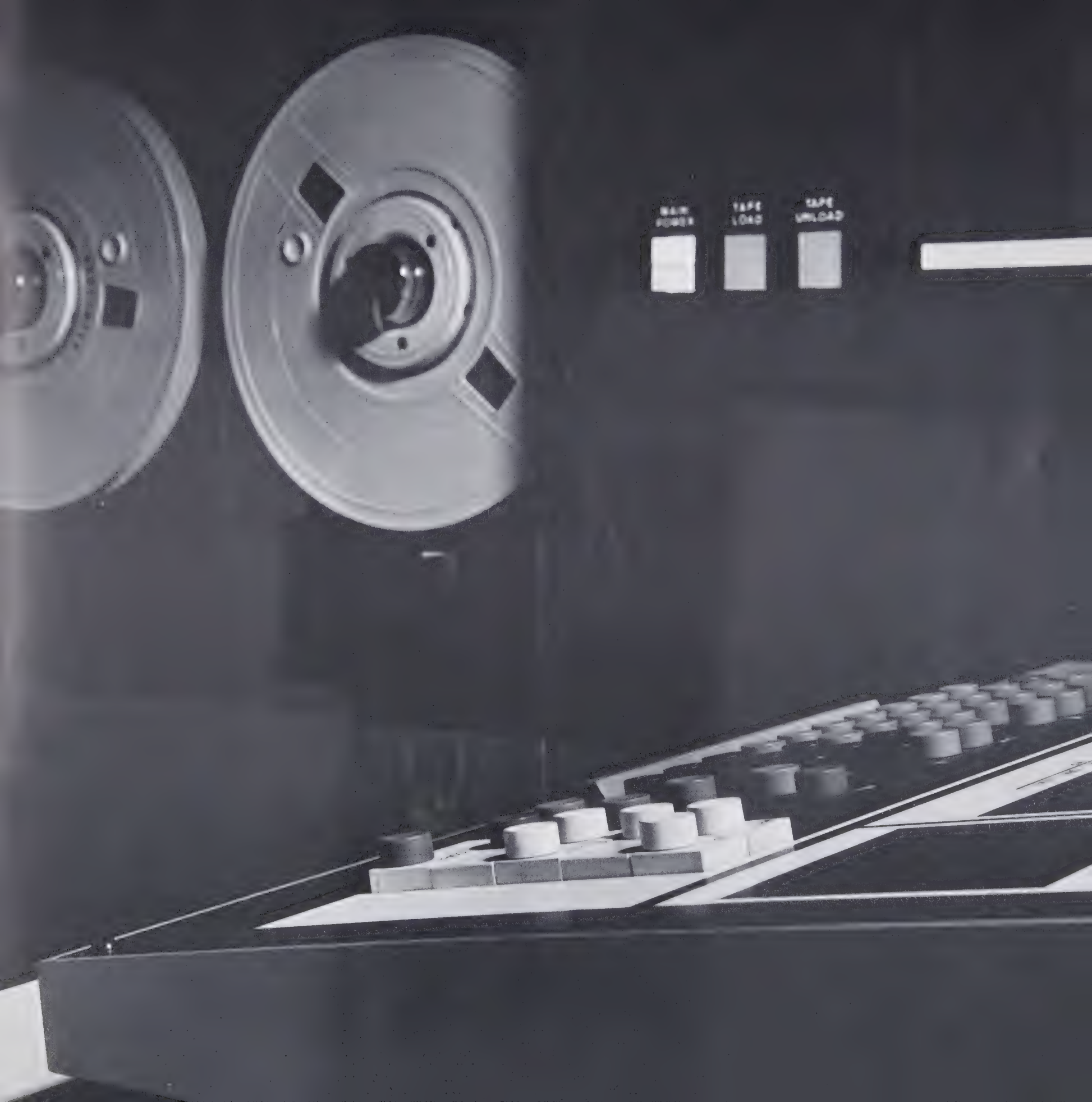
And because of the simplicity of her task, the typical KEYTAPE operator works in a relaxed, confident atmosphere that is 33% more productive than a keypunching environment.





KEYTAPE's outstanding ease of operation — exemplified by its easy-to-read, color-coded keyboard — is further enhanced by its unique error sensing and correction provisions.

KEYTAPE monitors every keystroke for possible errors, halting instantly should one occur. At once, the KEYTAPE Status Panel not only advises the operator of an error condition but also directs her step-by-step through the required correction routine. Once this is done, she resumes transcribing — quickly and confidently, without sacrificing any valid information.



The technology that produced third-generation computers has finally come of age and made an input medium to match.

KEYTAPE's comfortable, convenient design keeps operators happy and makes data preparation faster and more efficient. KEYTAPE produces tape input, not card input, which the computer reads at tape-drive speeds, for execution at computer speeds.

KEYTAPE has broken the input bottleneck.

The Other Computer Company :
Honeywell

